Innovative services and integrated solutions for energy consumption efficiency

EnergyTeam®

A company that is constantly growing and developing

Founded in 1996 as an enterprise partnership between young professionals in the energy sector who due to their intuition and passion believed in a company project capable of developing and providing efficient solutions for the effective use of resources, Energy Team has never stopped growing in both size and ideas. It offers tools to monitor consumption and contain supply costs already in over 9,000 manufacturing sites in Italy and to those who are embarking on the path to efficiency for the first time.

Meeting the needs of operators in all sectors, from large industry to the high value-added service industry means facing clear and diverse consumption problems along with seeking energy efficiency that is able to combine economic growth and environmentally sustainable development. A comprehensive view of the national manufacturing situation has allowed us to gain experience and consolidate skills in every area (from electricity to natural gas, thermal to water and compressed air, etc.) and to grow along with our customers and for our customers.

From the technical and commercial relationships developed over the years with major energy Suppliers and Distributors on one hand and large industrial groups and/or consortia on the other, we have given shape and functionality to the most advanced applications for monitoring, detecting and managing data. Thanks to the synergistic collaborations we started with authoritative Research Centres, we provided efficiency and reliability that favoured their further expansion.

Products that were entirely designed and created in Italy are distributed by Energy Team through its own sales network. We have recently begun introducing these products in various foreign markets, accepting with renewed passion the challenge to export quality Italian technological innovation.

A qualified response to the Customer's needs

PRODUCTS AND SERVICES

ELECTRICITY

- Load monitoring and management systems for Customers in the electricity market.
- Remote reading systems for Suppliers/Consortia and for multisite companies.
- Electrical parameter measurements for "ARPA" reports.
- Multifunction tools for measuring electrical quantities in MV/LV and the division of consumption in cost centres.
- Measurement groups used by the Finance Officethat can be used to obtain tax exemptions on the consumption of "tax-free" loads
- Systems for the management of cogeneration plants.
- LSPU systems for "Interruptible" customers compliant with GRTN (Italian Independent System Operator) specifications
- Portable instruments for the analysis of electric factors.

PHOTOVOLTAICS

- Measurement systems and comprehensive control platform for photovoltaic system efficiency.

NATURAL GAS

- Monitoring systems for alarms and load management for industrial users.
- Battery powered remote transmission systems for consumption and gas alarms via SMS for Gas Suppliers/Distributors.
- Non-fiscal measurement correctors (PTZ) for the division of consumption for cost centres.
- Fiscal measurement groups (meters and correctors) suitable for obtaining a reduction in fixed costs (turnkey product including sealing and metric controls).
- Scheduled maintenance of 1st and 2nd level gas pressure reduction stations.
- Metric controls of fiscal converters.
- Non fiscal gas meters (quantimeters) for the calculation of gas consumption for each load.

WATER AND HEAT

- System for monitoring global and partial consumption
- Remote transmission systems for water consumption /alarms via SMSwith battery power for water distributors.
- Flow meters and instruments for water measurements.
- Wastewater parameter measurements for "ARPA" reports.
- Thermal Energy Meters (Hot/Cold).

COMPRESSED AIR

- Compressed Air Audit.
- Calculation of the kw/m^3 and subsequent energy cost for each m^3 of air consumed.
- Verification of the real and quantifiable benefits in terms of energy savings through compressor behaviour simulations.
- Identification of possible actions to improve system efficiency.
- Creation of a list of critical issues, creation of investment plan.
- Design verification of production/distribution plants Pneumatic Energy.

OTHER UTILITIES

- Systems for monitoring global and partial consumption of other utilities such as steam, compressed air, etc.
- Temperature and humidity control systems.
- Flow meters and instruments for measuring steam, fuel, compressed air.

REMOTE CONTROL

- Distributed intelligence systems for the supervision of Technological systems.
- Systems for the identification and transmission of alarms with event log recording.
- Programmable software clocks

SERVICES

- Remote reading of power and gas fiscal meters
- Daily publishing of power consumption on the web to monitor and assess costs.
- Outsourcing services and measurement campaigns aimed at the promotion of energy efficiency in final uses (production/services) and the implementation of corporate projects for energy saving.

MANUFACTURING FIELDS OF APPLICATION

The wide range of Tools & Services offered allows us to adequately support users engaged in virtually every industry owing to the effective compatibility of the technology developed using the measurement requirements specific to the various energy resources used for production purposes (electricity, water, steam, air) and the extremely low structural impact generated by their implementation in plants and offices. Below is a list of just some of the processing and trade categories where our solutions are currently applied:

Clothing & Accessories (production and sales) • Ordinary & Special Steel • Agriculture& Food • Hotels • Furnishings • Insurance • Industrial Automation • Automobiles • Motorways • Municipalized service companies • Hospital Authorities • **B**anking • Beverages & Mineral Water • Biomedical • **S**hipbuilding Industry • Paper Mills and the Paper, Cardboard & Cellulose Industry • Concrete & Cement • Ceramic Tiles for floors and Artistic Ceramics • Chemistry, Cosmetics & Perfumery • **C**confectionary • **P**ublishing & Graphics • Appliances • Electricity & Gas (production, distribution & supply) • Mining • **P**harmaceuticals • Fairs & Entertainment • Yarns &Fibres • Foundries& Alloys • **L**arge Distribution (supermarkets) • Natural & Synthetic Rubber • **I**T & Computer Services • Hydrocarbons • Health & Hygiene • Industry & Manufacturing (in general) • Plastic Laminates • Bricks • Research Institutes • Metal Processing • Wood& Similar Products • Cold Chain Logistics • **F**eedstuff • Marble & Similar Products • **P**lastic Materials • Metalworking • **O**il mills • **P**asta factories • Leather goods & Shoes • Petrochemical • Aluminium& Plastic profiles • Public Administration • **C**atering • Taps & Fittings • Services • **M**oulding • **W**eaving • Dye-works • Transportation & Infrastructure • **M**iscellaneous tools • **C**oatings • Glass & Crystal •

TABLE OF CONTENTS

X-Meter DIN
Electrical mains analyzer and Datalogger in a single instrument
Available in version 5A(**) or with voltage inputs (***)

> Bidirectional Meter (Imported/delivered power)
> 50 true measurements
> Measurements in true value (true RMS)
> Measurements on 4 quadrants
> Graphic display, size of characters can be set
> Full and clear indications of measurements
> 6-key keyboard with buzzer
> Configurable pulsed outputs of all measured quantities
> Configurable alarm outputs of measured quantities
> Graphic display of Voltage, Current, Power and COSƒ for the last 3 days
> 12 Power Totalizators on 4 quadrants that can be reset using a password
> Indication in Euros of absorbed and delivered power
> Clock and Calendar
> Container of DIN rail 46277 (9 modules)
> Removable clamps to make installation easier
> Temperature probe inside the instrument
> Software TA and TV inversion function
> Expansion and modularity (memory, digital inputs, GSM/GPRS modem, Ethernet, email, quality of supply).

The advantages are clear:
The cost is comparable to any other simple multifunction device but it has better initial features (graphic display, pulsed outputs for power taken, short storage of consumption levels in log) plus it can be transformed into a true Power Quality instrument without having to replace it. Create your X-Meter whenever and however you want. Check the list for all of the possible options.

Options

XM1	Memory Extension and Communication
XM2	Mod.A Bridge 232/485 Mod.B Bridge USB/485
XM3	Mod.8 Digital Inputs
XM4	Mod. GSM/GPRS Modem
XM5	Mod. Ethernet Network
XM6	Mod. Harmonic Recordings
Es3	Supervision Software

Technical Data

Measurements on 50/60Hz g4rid	
Voltage	Vac
Active Power	W
Reactive Power	VAr
Apparent Power	VA
Distorting Power	VA
Three-phase equivalent current	A
Mains current	A
Cosƒ	
Power factor	
Active power delivered	Wh
Active power absorbed	Wh
Inductive reactive power	VArh
Capacitive reactive power	VArh
Frequency	Hz
Precision	+/- 0.25% of full scale Meas. Val. +/- 0.50% of full scale Deriv. Meas. Val.
Power supply	
Power voltage	100-250 Vac / 100-350 Vdc
Frequency	50-60 Hz
Consumption	5 Va
General	
Voltage inputs N.3	100 o 400 Vac
Current inputs	(**) 3 current inputs with 5ARMS voltage output
	(***) 3 inputs in specific current for sensors with 1VtRMS voltage
Pulsed outputs N.2 (Act/React)	
Optomos outputs (N.1 Min N.1 Max)	100 mA / 24 Vdc
Protection rating	IP 20
Weight	400 gr
Dimensions LxHxW 9 DIN modules	157.5 x 90 x58 mm
Graphic	Display
Operating temperature	-10°C + 55°C
Relative humidity	95% non-condensing

Dimensions and Terminal boards

M1 Power supply - *Maximum cable section: 2 mm² (16AwG)*
M2** Current input- *Maximum cable section: 2.5 mm² (14AwG)*
M7*** Voltage signal inputs (current measurements) *Maximum cable section: 0.75 mm² (14AwG)*
M3 Voltage inputs - *Maximum cable section: 2.5 mm² (14AwG)*
M4 Digital outputs - *Maximum cable section: 0.75 mm² (18AwG)*
M5 FS485 - *Maximum cable section: 0.75 mm² (18AwG) Belden 9841*
M6 Digital inputs - *Maximum cable section: 0.75 mm² (18AwG)*

I/O Serial Connections
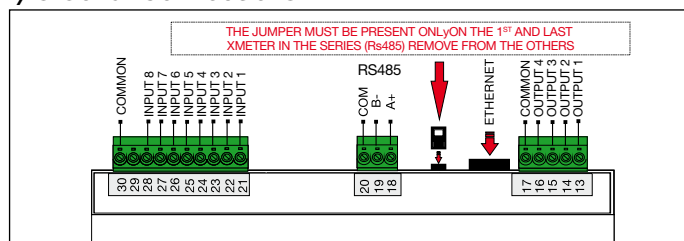
Options

XM1 - Memory Extension and Communication

To interface the device to the Es3 software, it is necessary to enable this function. This option allows for a considerable increase in storage capacity, allowing the device to record all of the values measured by the instrument and to extend the memory capacity of the recordable days, up to an archive of 250 days. (Integration time of 15' for the following values: line voltage and phase voltage, three-phase line current, three-phase active power, three-phase reactive power, three-phase power factor). Furthermore, by enabling the RS485 communication port through which it is possible to use a Personal Computer through a BRIDGE module (not included), it is possible to connect a series of EnergyTeam devices.

XM2 - Mod.A Bridge 232/485 Mod.B Bridge USB/485

The Bridge 232/485 conversion module with 230Vac power supply in 4 DIN module container, can be used to convert the 485 signal coming from the X-Meter in 232 serial towards the communication port of the Personal Computer. USB/485 version also available. The module can be used to convert the 485 signal coming from the X-Meter to the USB port on a Personal Computer. Galvanic isolation of the USB connection ensures maximum protection of the PC from disturbances or voltage surges coming from the field. Designed with industrial features. No bulky external power supply is needed as it is self-powered. One of a kind.

XM3 - Module 8 Digital Inputs

Module with 8 self-powered digital inputs at 12Vdc. It can be used for the acquisition of conditions and pulses coming from external meters such as those for gas, water, air, etc. Furthermore, it is possible to separately archive the various acquisition channels by checking the logs using the specific software (not included). This function is possible with at least the XM1 function enabled.

XM4 - GSM/GpRSMOdule

The GSM/GPRS modem inside the X-Meter device allows for the sending of emails and SMS associated with conditions and alarms coming from the "field", connected with the XM3 function (Module 8 digital inputs). Furthermore, thanks to this module, it is possible to control the X-Meter device remotely for the online data publication service through our website, www.energyteam.it. Our site can be accessed at anytime, anywhere with a userid and password. The displayed data can also be converted into Excel and Access format and downloaded to your PC. This function is possible with at least the XM1 function enabled.

XM5 - Ethernet Module

The Ethernet card inside the device allows X-Meter to be connected to the corporate Ethernet or intranet from various data collection and monitoring stations through a simple IP address. This function is possible only with the XM1 functions and Es3 software enabled.

XM6 - Harmonic recording module

Module for harmonic measurements which allows for the measurement and storage function up to the 25th measurement.

XM7 - Annual programmable clocks

The "programmable clocks with perpetual annual calendar" firmware module is used to enable the 4 Optomos outputs on the X-Meter DIN for the automatic control function to switch specific utilities on and off (controllable loads e.g., lights, motors, fans, etc.). Each X-Meter can be programmed with up to 12 daily profiles +profiles 2 special periods + 20 special days. Each profile defines 8 conditions changes within the 24 hours per day for each of the 4 associated loads. Up to 128 X-Meters can be connected for a total of 512 controllable loads. This function is possible only with the XM1 function enabled.

XM8 - Galvanically Isolated Analogue Channel

Inserted in a 1 Mod. DIN containers, it allows for the interfacing of voltage or current signals coming from the field to the X-Meter device inputs, allowing the display and storage of the measured values. The X-Meter device is able to power up to 2 XM8 modules. Any additional modules must be supported through a 12Vdc power supply (not included). There are 11 possible interface configurations for voltage and current signals. Guaranteed precision of 0.5% of the full scale.

XM9 - Probe interface module pT100-500-1000

Inserted in a 1 Mod. DIN container, it allows for the interfacing of PT100, PT500 and PT1000 temperature probes at the inputs of the X-Meter device, enabling the display and storage of the measured temperatures. The X-Meter device is able to power up to 2 XM8 modules. Any additional modules must be supported through a 12Vdc power supply (not included). Guaranteed precision at0.5 % of full scale.

XM10 - Room temperature module

Container suitable for wall installation. It can read the room temperature (range -10 °C +65°C +- 1.5°C) and transfer it to the XMETER device inputs, thus enabling the displaying and storing of the temperatures measured. The X-Meter device is able to power up to 2 XM10 modules. Any additional modules must be supported through a 12Vdc power supply (not included). It is particularly suitable to monitor and save the room temperatures in Ced, LV/MV panels, Warehouses.

XM11 - Room temperature and humidity module

Container suitable for wall installation. It can read the room temperature and humidity and transfer it to the XMETER device inputs thus enabling the displaying and storing of the temperatures and humidity values measured. The X-Meter device is able to power up to 2 XM11 modules. Any additional modules must be supported through a 12Vdc power supply (not included). It is particularly suitable to monitor and save room temperatures and humidity values in the food industry. Humidity Range (Relative Hum 0-100%) Accuracy ±2% in the range of rel. hum. 10% 90% Temp Range (-10°C +65°C) Accuracy ±0,8°C to 25°C ±0.3°C.

XM12 - USB/GSM Modem (PC/X-Meter connection)

The GSM modem for remote reading of data and remote programming is easy to connect to a PC thanks to the integrated USB connection.

XM14 - Power quality

Module for recording voltage peaks and values with 10 ms resolution. It can also measure and store up to the 25th harmonic, both voltage and current. A local alarm can be enabled when the event occurs, set in advance.

XM15 - Load interface relay module

To use the 4 outputs to drive standard loads in a 220Vac single phase network, they must be interfaced to the XM15 module. With 220Vac, it makes 4 completely independent relays available with the ability to switch any load up to 16A.

XM18 - Load management module

Through the control of the 4 outputs carried out using a sophisticated algorithm, it is possible to actively intervene in the management of electrical loads in order to eliminate or minimize exceeding the power contracted with the energy supplier.

XM UPS - Dedicated DIN UpS

Extremely small backup power supply in 6 DIN module container with cutting edge batteries (lithium polymer) to supply an X-Meter device for up to a maximum of one hour.

Supervision Software

Supervision and control Software. Request the technical documentation or visit our sitewww.energyteam.it.

List of Measurements

Direct measurements for single-phase
> Phase-neutral voltage L1-N
> Phase-neutral voltage L2-N
> Phase-neutral voltage L3-N
> Phase-phase voltage L1-L2
> Phase-phase voltage L2-L3
> Phase-phase voltage L3-l1
> Line Current L1
> Line Current L2
> Line Current L3

Single-phase derived measurement
> Bi-directional active power L1 (positive=imported (Q1 and Q4), negative=exported (Q2 and Q3)
> Bi-directional active power L2 (positive=imported, negative=exported)
> Bi-directional active power L3 (positive=imported, negative=exported)
> Bi-directional active power L1 (positive=imported (Q1 and Q4),
> Bi-directional active power L2 (positive=imported),
> Bi-directional active power L3 (positive=imported),
> Distorting power L1 (indication of presence of current harmonics)
> Distorting power L2 (indication of presence of current harmonics)
> Distorting power L3 (indication of presence of current harmonics)
> Apparent Power L1
> Apparent Power L2
> Apparent Power L3
> Power factor L1
> Power factor L2
> Power factor L3

Main measurements of three-phase system
> Three-phase equivalent voltage phase-neutral
> Three-phase equivalent voltage phase-phase
> Three-phase equivalent current
> Three-phase active power (positive=imported (Q1 and Q4), negative=exported) / Bidirectional
> Three-phase reactive power (positive=imported (Q1 and Q2) / Bidirectional

Secondary measurements of three-phase system
> Three-phase equivalent distorting power
> Three-phase equivalent apparent power
> Three-phase equivalent power factor
> Calculated neutral current
> Neutral-centre voltage ideal star N-O
> Frequency (measured on voltage input L)

Integrated power values of three-phase system
> Elmported active power (Q1 and Q4)
> Imported active power (Q1 and Q4)
> Exported active power (Q2 and Q3)
> Imported reactive power (Q1)
> Imported reactive power (Q2)
> Imported reactive power (Q3)
> Imported reactive power (Q4)
> Imported active power (Q2 and Q3)
> Imported active power (Q1)
> Imported active power (Q2)
> Imported active power (Q3)
> Imported active power (Q4)

Compliance

Applied standards
> EN 55011(class A)
> EN 61000-4-2 -EN 61000-4-5
> EN 61000-4-6
> EN 61000-4-11
> EN 61000-4-3
> EN 61000-4-4
> EN 60204-1

Instrument potential

Storage of historical data

> Monitoring and storage of 50 measured values.
> Storage for up to 250 days of the measured value.
> Division of consumption costs of each installed device.

SMS
Device alarms and exceeding measured thresholds.

> Acquisition and storage of conditions coming from the field.
> Acquisition and storage from other meters with pulsed output.

> Management of programmable clocks
> Sending SMS with conditions coming from the field.
> Sending email with conditions coming from the field.
> Sending SMS with alarms that can be set on themeasurements performed.
> Sending Email with alarms that can be set on themeasurements performed.

Acquisition from other meters

> Connection to PC and to a series of other devices through supervision and control software.
> Remote control device with ability to access the data publication service on the web.

Data publication on the Web

Electrical mains analyzer

Panel X-Meter 96

> CBidirectional Meter (Imported/delivered power)
> 50 true measurements
> Measurements in true value (true RMS)
> Measurements on 4 quadrants
> Graphic display, size of characters can be set
> Full and clear indications of measurements
> 6 key keyboard
> Configurable pulsed outputs of all measured quantities
> Configurable alarm outputs of measured quantities
> Graphic display of Voltage, Current, Power and COSf
for the last 3 days
> 12 Power Totalizators on 4 quadrants that can be reset using a password
> Indication in Euros of absorbed and delivered power
> Clock and Calendar
> Removable clamps to make installation easier
> Temperature probe inside the instrument
> Software TA and TV inversion function
> Expansion and modularity (memory, digital inputs, GSM/GPRS modem, Ethernet, email, quality of supply).
> 96x96 built in container.

Options

XM1 - Memory Extension and Communication

XM2 - Mod.Bridge 232/485

XM3 - Mod.4 Digital Inputs

XM4 - Mod. Modem Gsm/Gprs

XM5 - Mod. Rete Ethernet

XM6 - Mod. Harmonic recording
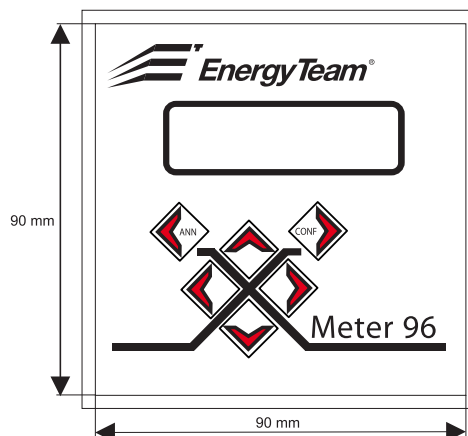
Es3 - Supervision software

The advantages are clear:
The cost is comparable to any other simple multifunction device but it has better initial features (graphic display, pulsed outputs for power taken, short storage of consumption levels in log) plus it can be transformed into a true Power Quality instrument without having to replace it. Create your X-Meter whenever and however you want. Check the list for all of the possible options.

Technical Data

Measurements on 50/60Hz g4rid	
Voltage	Vac
Active Power	W
Reactive Power	VAr
Apparent Power	VA
Distorting Power	VA
Three-phase equivalent current	A
Mains current	A
Cos$f$	
Power factor	
Active power delivered	Wh
Active power absorbed	Wh
Inductive reactive power	VArh
Capacitive reactive power	VArh
Frequency	Hz
Precision	+/- 0.25% of full scale Meas. Val. +/- 0.50% of full scale Deriv. Meas. Val.
Power supply	
Power voltage	100-250 Vac / 100-350 Vdc
Frequency	50-60 Hz
Consumption	5 Va
Generali	
Voltage inputs N.3	100 or 400 Vac
Current inputs N. 3	A / 5
Optomos Pulsed Outputs	N.2
Alarm configuration	only with opt. Xm1 100 mA / 24 Vdc
Protection rating	IP 20
Weight	500 gr
Dimensions LxHxW 9 DIN modules	90 x 90 x 150 mm
Graphic	Display
Operating temperature	-10°C + 55°C
Relative humidity	95% non-condensing

Dimensions

90 mm

90 mm

Inputs Outputs

150 mm

160 mm

Efficiency Terminal
Portable electrical mains analyser
Check your Energy Efficiency
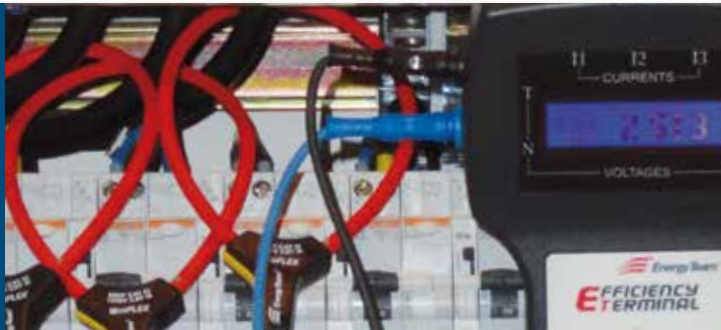
Professional measuring instrument, indispensable for sampling:
> 50 electrical parameters
> Voltage drops
> Harmonics
> Digital values
> Equipped with Rogowski system
> Internal rechargeable battery: 8 hours of autonomy
> External power supply to recharge the battery
> Class 0.5

Reliable

Allow extremely precise measurement on three-phase and single-phase electrical lines with up to 250 days of continuous recording (with integration time of 15') of the following values: phase voltage, three-phase line current, three-phase active power, three-phase power factor detecting the various electric factors with an error of less than ±0,5% of the selected full scale. You can also sample different values and parameters by enabling the related options.

Versatile

The instrument's extreme flexibility allows extremely precise measurement inside the selected scale of a wide range of electrical loads. The Rogowski current probes allow measurements from 1 to 2000 amperes while maintaining the declared precision. It is a tool for all circumstances, to sample and analyze any load, from your mobile phone battery charger to the consumption of a melting furnace.

Operational

Easy programming of the parameters and measurement ratios.USB port for quick and easy transfer of the data to a PC so it can then be analyzed using the Es3 processing software included with the device. Complete and specific supply of 3 Rogowski current probes with a measurement range from 1 to 2000 amperes and 4 silicone double insulated CAT III cables. Both are supplied at over 2.5 mt to allow them to be used in the most critical situations.

Portable

The small size, battery life and ability to power it from an external module allow you to perform measurements for the desired duration.
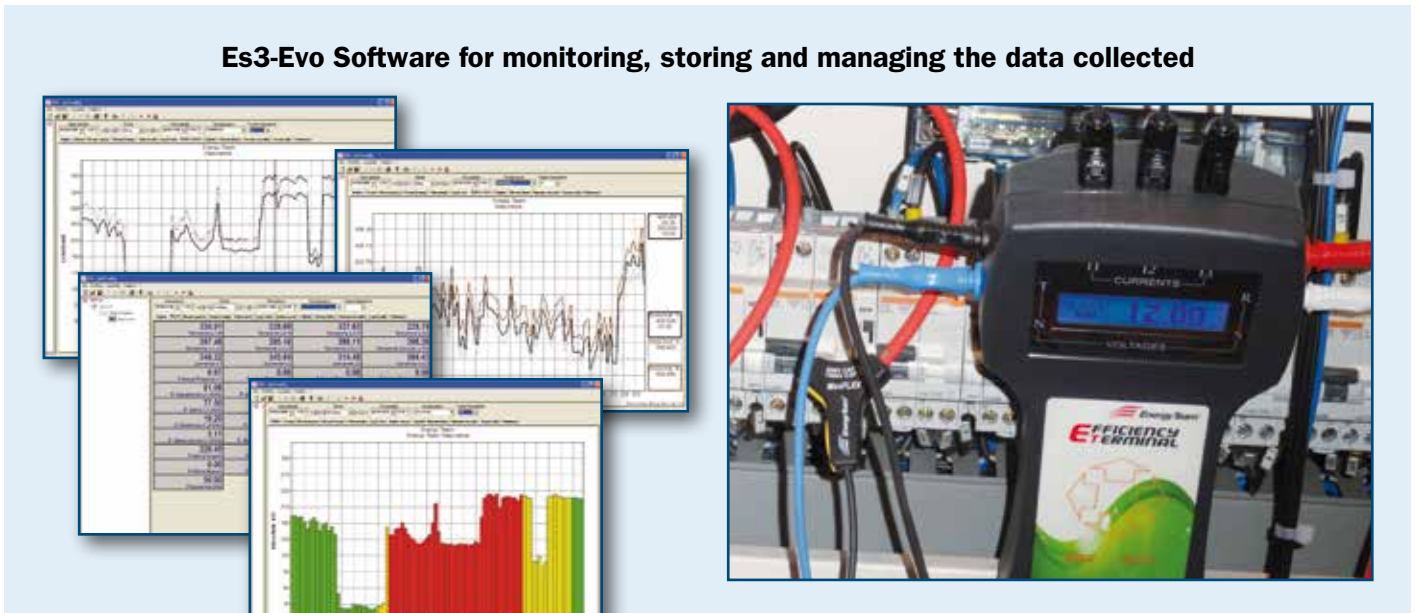
Software

The Es3-Evo software, specializing in Energy Efficiency, is used by thousands of companies. The analysis, even if performed only briefly, allows the identification of possible waste, consequently reducing energy costs.

Basic device equipment

> 50 electrical measurements performed
> Recording of voltage peaks and values with 10 ms resolution.
> Registration of up to the 25th harmonic on voltage and current.
> Graphic display, size of characters can be set
> USB port
> Measurements in true value (true RMS)
> Measurements on 4 quadrants
> Full and clear indications of measurements
> Simple and fundamental programming of the parameters and ratios of measurements through the keyboard.
> Graphic display on the display for the last 3 days of: Voltage, Current, Power, Cos, Harmonics and THD.
> 12 Energy Totalizators on 4 quadrants
> Clock and Calendar
> 3Vac voltage inputs: 230V Phase-Neutral, 400V Phase-Phase
> Precision 0.50% of full scale (measured value)
> External connectors for inserting: 2 digital inputs (channels) through mini-DIN connector; USB to monitor data from the PC; Inputs for Voltage and Current; connector for external power supply.
> Weight: 800 gr.
> Power supply: 12 Vdc through internal lithium ion battery, rechargeable. Autonomy: 8 hours. External power supply 230 Vac / 12 dc to recharge the battery
> Operating temperature from -10°C to +55°C
> Relative humidity: 95% non-condensing
> USB cable, 1.5 mt
> Es3-Evo software for monitoring, storing and managing the data collected.
> User manual and software.
> Compliance: EN 55011, (class A) EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 60204-1.
> 3 Rogowski current probes, flexible and operable. Tightening diameter: 100 mm. Cable length: 2.5 m Single and Three-phase measurement (from 1 to 3 sensors). Full scale capacities 60, 125, 250, 500, 1000, 2000 Amperes.
> 4 cables for measuring voltage, silicone CAT II with double insulation, length 2.5 m
> Compatibility EN 50081-1 Class B, EN 50082-2, CEI 1000-4-2, CEI 1000-4-3, CEI 100-4-4, CEI 1000-4-8, CEI 1010-1, CEI 1010-2-032.

Es3-Evo Software for monitoring, storing and managing the data collected

Datalogger

X-RWU

Options

XM2 - USB/485 interface
XM4 - Mod. GSM/GPRS Modem
XM5 - Mod. Ethernet Network
XM7 - Mod. Yearly Programmable clock
XM8 - Galv. Isolated Analogue Channel
XM9 - Probe Interf.Mod. PT 100
XM10 - Room temperature module
XM11 - Room temperature and humidity module
XM15 - Load Interf. Relay Module
XM - Load control
XM UPS - Micro UPS
ES3 - Supervision Software

> Graphic display, size of characters can be set
> Can be configured with each individual channel
> 8 self-powered digital inputs at 12 Vdc
> 4 digital optomos outputs (100 mA - 24 DC)
> 1 Mb internal flash memory
> RS485 Communication port
> 6-key keyboard with buzzer
> Clock and Calendar
> Container of DIN rail 46277 (9 modules)
> Removable clamps to make installation easier
> Expansion and modularity (GSM modem, LAN card, analogue channels, temperatures, programmable timers).

Monitor, Store, Manage

> System status
> Alarms
> Analogue measurements (4-20mA, 0-10V, etc.)
> Process temperatures
> Room temperatures
> Measurements coming from various meters

Compliance - Applied standards

> EN 55011(classe A)
> EN 61000-4-2 -EN 61000-4-5
> EN 61000-4-6
> EN 61000-4-11
> EN 61000-4-3
> EN 61000-4-4
> EN 60204-1

Technical data

Power supply	
Power voltage	100-250 Vac
Frequency	50-60 Hz
Consumption	5 Va
General	
8 Digital inputs	
Digital input frequency	10 Hz Max.
4 Optomos outputs	100 mA/24 Vdc
Protection rating	IP 20
Weight	400 g
Dimensions LxHxW 9 DIN modules	157.5 x 90 x58 mm
Graphic	Display
Operating temperature	-10 °C + 55 °C
Relative humidity	95% non-condensing

Dimensions and Terminal boards

M1	Power supply	*Maximum cable section*: 2 mm² (16AWG)
M4	Digital outputs	*Maximum cable section*: 0.75 mm² (18AWG)
M5	Rs485	*Maximum cable section*: 0.75 mm² (18AWG) Belden 9841
M6	Digital Inputs	*Maximum cable section*: 0.75 mm² (18AWG)

Collegamenti seriali I/O

JUMPER DEVE ESSERE PRESENTE SOLO SUL 1° ED ULTIMO XMETER DELLA SERIE (Rs485) ELIMINARLO PER I RESTANTI
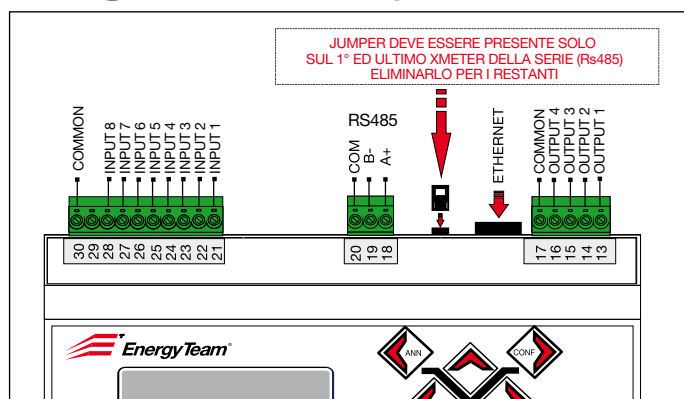
Options

XM2 - Mod.A Bridge 232/485 Mod.B Bridge USB/485

The Bridge 232/485 conversion module with 230Vac power supply in 4 DIN module container, can be used to convert the 485 signal coming from the X-RWU in 232 serial towards the communication port of the Personal Computer. USB/485 version also available. Galvanic isolation of the USB connection ensure maximum protection of the PC from disturbances or voltage surges coming from the field.

XM4 - GSM/GPRS Module

The GSM/GPRS modem inside the RWU device allows for the sending of emails and SMS associated with conditions and alarms coming from the "field". The use of this module also allows remote visibility of the X-RWU device for providing data publication on the web through our website, www.energyteam.it.

XM5 - Ethernet Module

The Ethernet card inside the device allows X-RWU to be connected to the corporate Ethernet or intranet from various data collection and monitoring stations through a simple IP address.

XM7 - Annual programmable clocks module

The "programmable clocks with perpetual annual calendar" firmware module is used to enable the 4 Optomos outputs on the X-RWU DIN for the automatic control function to switch specific utilities on and off (controllable loads e.g., lights, motors, fans, etc.). Up to 12 daily profiles + 2 special periods + 20 special days can be programmed on each X-RWU. Each profile defines 8 conditions changes within the 24 hours per day for each of the 4 associated loads. Up to 128 X-RWU can be connected for a total of 512 controllable loads.

XM8 - Galvanically Isolated Analogue Channel

Inserted in a 1 Mod. DIN rail, it allows for the interfacing of voltage or current signals coming from the field to the X-RWU inputs, allowing the display and storage of the measured values. The X-RWU device is able to power up to 2 XM8 modules. Any addition modules must be supported through a 12Vdc power supply (not included). There are 11 possible interface configurations for voltage and current signals. Guaranteed precision of 0.5 % of full scale.

XM9 - Probe interface module PT100-500-1000

Inserted in a 1 Mod. DIN rail, it allows for the interfacing of PT100, PT500 and PT1000 temperature probes at the inputs of the X-RWU device, enabling the display and storage of the measured temperatures. The X-RWU device is able to power up to 2 XM8 modules. Any additional modules must be supported through a 12Vdc power supply (not included). Guaranteed precision of 0.5% of the full scale.

XM10 - Room temperature module

Container suitable for wall installation. It can read the room temperature (range -10 °C +65°C +- 1.5°C) and transfer it to the X-RWU device inputs thus enabling the displaying and storing of the temperatures measured. The X-RWU device can supply up to 2 XM10 modules. It is particularly suitable to monitor and save the room temperatures in Ced, LV/MV panels, Warehouses, etc.

XM11 - Room temperature and humidity module

Container suitable for wall installation. It can read the room temperature and humidity and transfer it to the X-RWU device inputs thus enabling the displaying and storing of the temperatures and humidity values measured. The X-RWU device is able to power up to 2 XM11 modules. Any additional modules must be supported through a 12Vdc power supply (not included). It is particularly suitable to monitor and save room temperatures and humidity values in the food industry. Humidity Range (Relative hum. 0-100%) Accuracy ±2% in Rel. Hum. range 10% 90% Temp Range (-10°C +65°C) Accuracy ±0,8°C to 25°C ±0,3°C.

XM15 - Load interface relay module

By enabling a sophisticated algorithm, it is possible to control the 4 outputs and actively intervene in the management of electrical loads in order to eliminate or minimize exceeding the power contracted with the energy supplier.

XM18 - Load management module

Through the control of the 4 outputs carried out using a sophisticated algorithm, it is possible to actively intervene in the management of electrical loads in order to eliminate or minimize exceeding the power contracted with the energy supplier.

XM-UPS - Dedicated DIN UPS

Extremely small backup power supply in 6 module Din rail with cutting edge batteries (lithium polymer) to supply an X-RWU device up to a maximum of 4 hours, indispensable to keep alarms operating even during a power failure.

ES3 - Supervision Software

Supervision and control Software. Request the technical documentation or visit our website www.energyteam.it.

Instrument potential

Storage of historical data

SMS Device alarms and exceeding measured thresholds.

> Monitoring and storing analogue measurements 4-20mA, 0-10V, etc.
> Monitoring and archiving outdoor and room temperatures.

> Acquisition and storage of conditions coming from the field.
> Acquisition and storage from other meters with pulsed output.

> Management of programmable clocks
> Sending SMS with conditions coming from the field.
> Sending email with conditions coming from the field.
> Sending SMS with alarms that can be set on the measurements performed.
> Sending Email with alarms that can be set on the measurements performed.

Acquisition of other meters

> Connection to PC and to a series of other devices through supervision and control software.
> Remote control device with ability to access the data publication service on the web

Data publication on the Web

XM4
GSM/GpRS Module

The GSM/GPRS modem inside the X-Meter device allows for the sending of emails and SMS associated with conditions and alarms coming from the field. The use of this module also allows remote visibility of the X-Meter device for providing data publication on the web. Our website www.energyteam.it, can be accessed with a Userid and password for consulting your data anytime and anywhere. This option can only be enabled together with the "XM1" memory extension function.
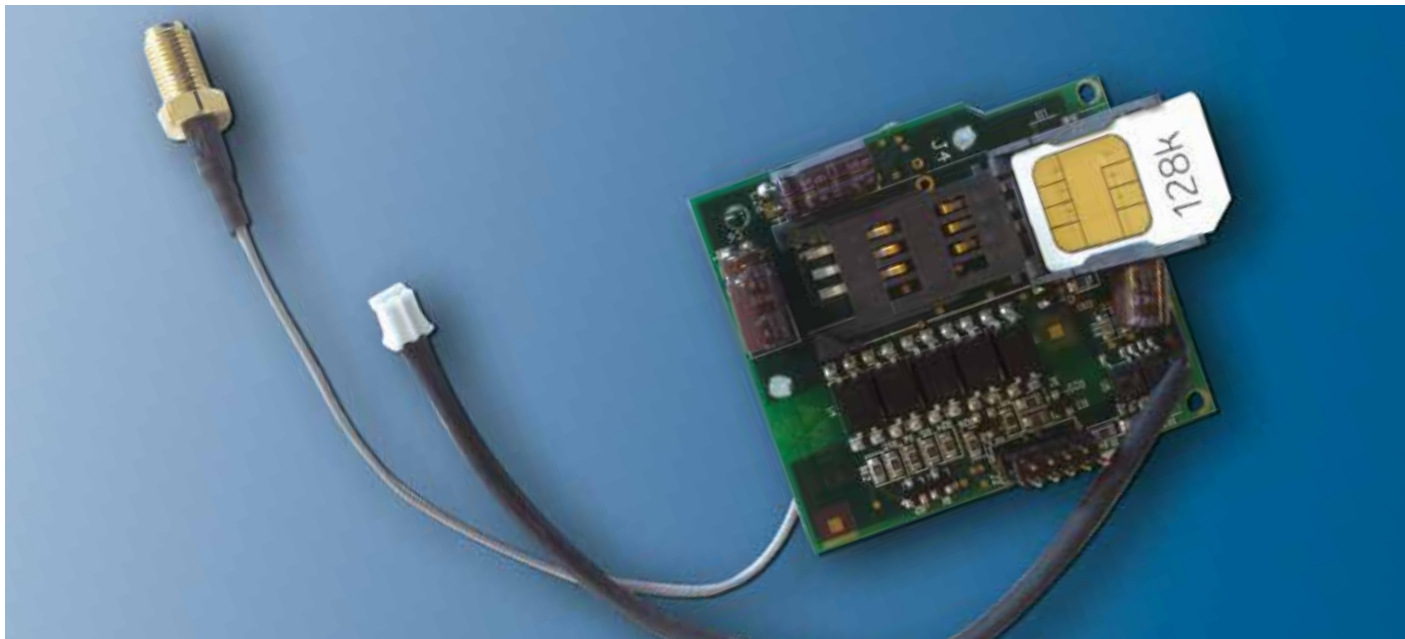
XM5
Ethernet Module

The Ethernet card inside the device allows X-Meter to be connected to the corporate Ethernet or intranet from various data collection and monitoring stations through a simple IP address. This option can only be enabled together with the memory extension function (XM1) and the "ES3" management software.
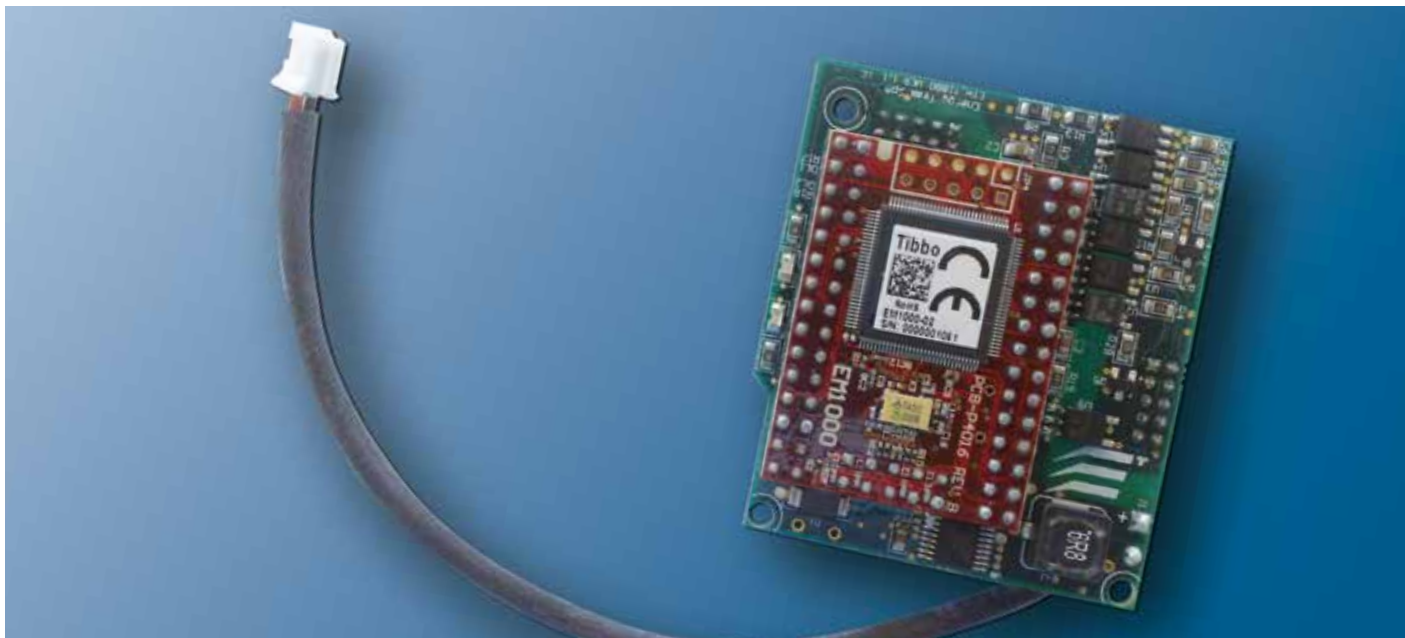
Options

XMP 20/50Vdc
DC/DC Step-up converter

Dimensions

98 mm

17,5 mm

60 mm

64 mm

Description

Input

Power supply indicator →

Output
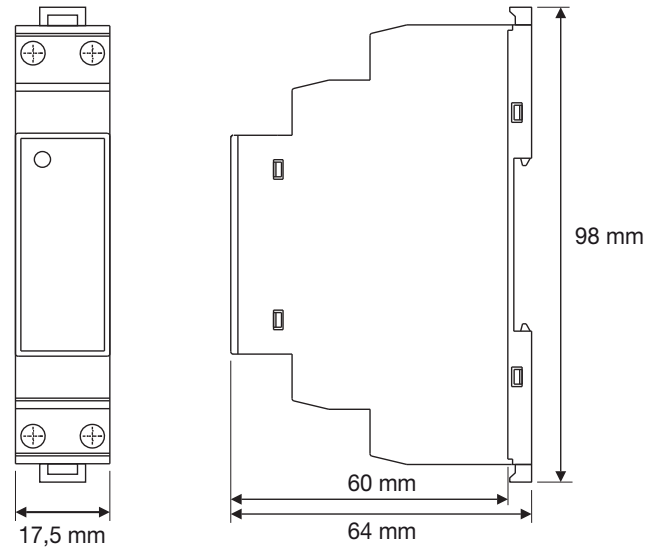
> Extremely small size
> Container built in compliance with DIN 438880
> Excellent price/quality relationship
> Modern design
> Screw connectors
> DIN EN50.022 installation

The XMP 20/50Vdc converter allows you to raise a DC voltage at 24-48Vdc to 200Vdc with a maximum power of 10W. This is useful when you need to power an X-Meter when only a 24-48 Vdc power supply is available.

Technical data

Input	
Nominal input voltage	24 - 48 Vdc ±15%
Maximum input current	0.07A (24V) - 0.03A (48V)
Input voltage surge protection (% of max VIN)	110%
Output (at 25°C)	
Nominal output voltage	200 Vdc ±2%
Maximum output current	0.05 A
Maximum output power	10 W
Output voltage surge protection (% of VOUT)	120%
Output overload protection (% of POUT)	110%
General	
Switching frequency (nominal)	100 kHz
Operating temperature	-10 °C +50 °C
Relative humidity (non-condensing)	<90%
Protection rating (EN60529)	IP20
Weight	50 g
Dimensions HxWxD	98 x 17,5 x 64 mm
Installation	DIN rail 35mm
Connections	screw

Wiring diagram

Input
24/48 Vdc ±15%

IN

OUT

Output
200 Vdc PMax: 10W
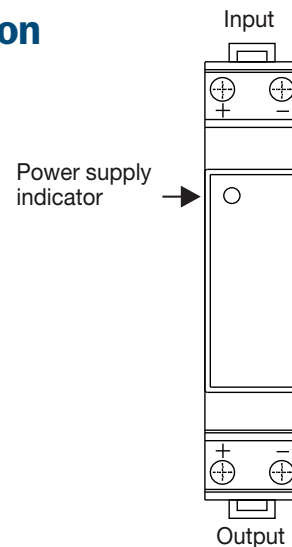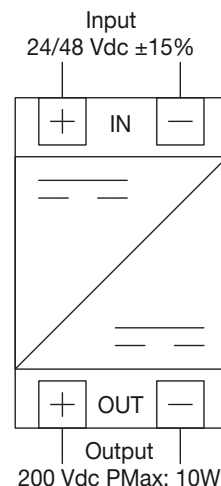
XM8

DIN module for analogue signal acquisition

Type	Range	Type	Range
Voltage	0V…+1V	Current	+4mA…+20mA
Voltage	0V…+5V	Current	0mA…+20mA
Voltage	0V…+10V	Current	-20mA…+20mA
Voltage	-1V…+1V		
Voltage	-5V…+5V		
Voltage	-10V…+10V		

IMPORTANT: The range and type of measurement are defined during the order phase. Any subsequent variations will require recalibration at our laboratory

Technical data

Power supply	12 Vdc
Consumption	0.85 W / 71 mA
Precision	0.5 % del F.S.
Operating temp range	-10+50 °C
Galvanic Ins. inputs/output imp.	2.5 KV
Screw terminal board Max	1.5 sq.mm.
Max voltage applicable at inputs	50 Vdc
Max current applicable at inputs	100 mA
No. T and C input configurations	9
Type of pulsed output	0/5 Hz
Weight	60 gr
Width	17.5 mm
Height	60 mm
Protection rating	IP20
Container type	1 Mod. DIN

The XM8 device allows the reading of an analogue current or voltage signal and to convert the value read in pulsed output with a frequency between 0 Hz and 5 Hz. Guaranteed precision of 0.5% of the full scale. A non-negligible feature is the 2.5 KV galvanic isolation between the inputs and the rest of the connections. The XM8 device allows the acquisition of one of the following signals.

Applications

In combination with devices like the X-Meter/RWU, it allows the acquisition of analogue measurements coming from meters, temperatures, levels or other sensors used in the industrial sector for production or environmental monitoring.

Notes for input connection

M- This is the negative input and is connected to the negative output of the source to be measured.

M+ This is the positive input and is connected to the positive output of the source to be measured.

⊥ Ground terminal for connecting the shielding.

Type of cable to use:
> 9841 Belden cable
> one pair plus 18 AWG shielding
> maximum length 10 meters

Notes for connecting power supply and outputs

- + Power supply 12 Vcc
The X-Meter device can supply up to 2 modules (XM8-9-10) on terminals 29 (+) and 30 (-).

AP Pulsed output positive terminal
> for X-Meter terminals from 21 to 28
> for RWU terminals EA-ER-SE-G SG-W

G Pulsed output negative terminal*
> for X-Meter, terminal 30
> for RWU terminals C1/2/3

Type of cable to use:
> single pole cable, max 1.5mm²
> max distance 500 meters

* connected inside the terminal

Status

The yellow "STAT" light comes on with everypulse received from the analogue source.

When the yellow and red LEDs are lit, there is an anomaly.

Status

The red "MEAS" LED is steady when the input measurement exceeds the range.

When the yellow and red LEDs are lit, there is an anomaly.

Options

XM9
DIN module for temperature acquisition from probes Pt100/500/1000

The XM9 device allows the reading of a temperature using a PT100, PT500 or PT1000 probe and the conversion of the value read in pulsed output with a frequency between 0Hz and 5Hz. In particular, the minimum value on the measurement scale implies an output impulse of frequency 0Hz (0 impulses per second) while the full scale is an output impulse of 5Hz (5 impulses per second). The probes that can be used may have 2 wires, 3 wires or 4 wires, even with a shielded cable. A non-negligible feature is the 2.5 KV galvanic isolation between the inputs and the rest of the connections.

Measurement accuracy

A pulsed output measurement tolerance of ±0.5°C is guaranteed with a range between -40°C and 150°C. The best precision is obtained through a 4 wire resistance temperature detector with a shielded cable.

Technical data

Power supply	12 Vdc
Consumption	0.85 W / 71 mA
Precision	0.5 % del F.S.
Measurement range	-40 +150 °C
Galvanic Ins. inputs/output imp.	2.5 KV
Screw terminal board Max cable dim.	1.5 sq.mm.
No. Configurations	3
Type of pulsed output	0/5 Hz
Weight	60 gr
Width	17.5 mm
Height	60 mm
Protection rating	IP20
Container type	1 Mod. DIN

IMPORTANT: The range and type of measurement are defined during the order phase. Any subsequent variations will require recalibration at our laboratory.

Applications

When combined with devices such as the X-Meter/RWU, it allows the acquisition of precise and reliable room and process temperatures for both the production industry or environmental monitoring.

Notes for input connection

A+ First power input PT, to connect to the red wire on the PT (or one of the two red wires on the PT if 2 are available).

M+ First PT measurement input, to connect to the second red wire on the PT (if 2 red wires are available) or to attach with the "A+" terminal (if only one red wire is available)

A- Second PT power input, to connect to the white wire on the PT (or one of the two white wires on the PT if 2 are available)

M- Second PT measurement input to connect to the second white wire on the PT (if 2 white wires are available) or to attach with terminal "A-" (if only one white wire is available)

⊥ Ground terminal for connecting the shielding.

Status

The yellow "STAT" light comes on with every impulse received from the analogue source. When the yellow and red LEDs are lit, there is an anomaly.
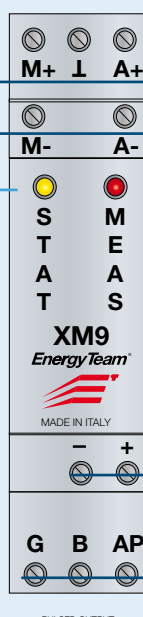
Notes for connecting power supply and outputs

- + Power supply 12 Vcc The X-Meter device can supply up to 2 modules (XM8-9-10) on terminals 29 (+) and 30 (-).

AP Pulsed output positive terminal
  > for X-Meter terminals from 21 to 28
  > for RWU terminals EA-ER-SE-G SG-W

G Pulsed output negative terminal*
  > for X-Meter, terminal 30
  > for RWU terminals C1/2/3

Type of cable to use:
  > single pole cable, max 1.5mm^2
  > distance max 500 meters

* connected inside the terminal

Status

The red "MEAS" LED is steady when the input measurement exceeds the range. When the yellow and red LEDs are lit, there is an anomaly.

M+ ⊥ A+
M- A-
STAT MEAS
XM9
EnergyTeam®
MADE IN ITALY
− +
G B AP
PULSED OUTPUT

XM10
Room temperature module

The XM10 device allows the reading of the room temperature using an internal probe and the conversion of the value read in pulsed output with a frequency between 0Hz and 5Hz.

XM10 comes in a plastic container with two holes (D=4.75mm) for easy wall-mounting using screws.

Measurement accuracy
The temperature range that can be measured with the XM10 is from -10°C to +65°C. A tolerance on pulsed output measurement of ±1.5 °C is guaranteed throughout the operating range.

Correct use conditions
For measuring the room temperature, it should be installed at about 1.8 m high, away from heat sources. A cable with two power supply conductors must be used for the module with a section of 0.5 mm2 and a section of no less than 0.22 mm2 for the pulsed output conductors. With this type of cable, the maximum length must not exceed 350 m.

XM10 module equipment and features
The module has two LEDs on the front panel:
> The **RED LED** is located on the front panel and flashes with every output impulse.It remains steady when the input measurement exceeds the range given above.
> The steady **GREEN LED** indicates that the device is in operation.

An upgrade from XM10 to XM11 can be done at any time, even by the customer, with the purchase of the built in temperature and humidity sensor and its installation inside the device.

Technical data

Power supply	12 Vdc
Consumption	0,85 W / 71 mA
Measurement range	-10+65 °C
Accuracy	±1,5 °C
Screw terminal board Max cable dim.	1.5 mm^2
Type of pulsed output	0/5 Hz
Weight	50 gr
Width	64 mm
Height	76 mm
Depth	26 mm
Protection rating	IP20
Container type	plastic

Applications

In combination with devices like the X-Meter/RWU it allows the acquisition of room temperatures in offices, CED, warehouses, shopping centres, etc.

WIRING DIAGRAM
X-METER   XM10

Via D. Repubblica n.9 20090
Trezzano Sul Naviglio, Milano
Tel. 02.48405033 - Fax 02.48405035
http://www.energyteam.it

EnergyTeam

X-METER	XM10		
	↓	1	
	H	2	
21 (IN.1)	T	3	
29 +	+	4	
30 —	—	5	

12 VDC

B.INTE   MADE IN ITALY

Pulses
↓ Pulsed output negative terminal*
> for X-Meter, terminal 30
> for RWU terminals C1/2/3

H Not used

T Pulsed output positive terminal
> for X-Meter terminals from 21 to 28
> for RWU terminals EA-ER-SE-G SG-W

- + Power supply 12 Vcc
The X-Meter device can supply up to 2 modules (XM8-9-10) on terminals 29 (+) and 30 (-).

* connected inside the terminal

Options

XM11
Room temperature and humidity module

The XM11 device allows the reading of the room temperature using an internal probe and the conversion of the value read in pulsed output with a frequency between 0Hz and 5Hz.

XM11 comes in a plastic container with two holes (D=4.75mm) for easy wall-mounting using screws. The device has a single, 5-pole connector that can be removed, with screw terminals for the power supply and pulsed output.

Measurement accuracy
The temperature range that can be measured with the XM11 is from -10°C to +65°C. A tolerance on pulsed output measurement of ±0.8 °C is guaranteed throughout the operating range (tolerance at 25°C equal to ±0.3°C.) while the relative humidity measurement, from 0% to 100% has a tolerance on pulsed output measurement of ±2% in the range between 10% and 90%.

Correct use conditions
For measuring the room temperature, it should be installed at about 1.8 m high, away from heat sources. A cable with two power supply conductors must be used for the module with a section of 0.5 mm2 and a section of no less than 0.22 mm2 for the pulsed output conductors. With this type of cable, the maximum length must not exceed 350 m.
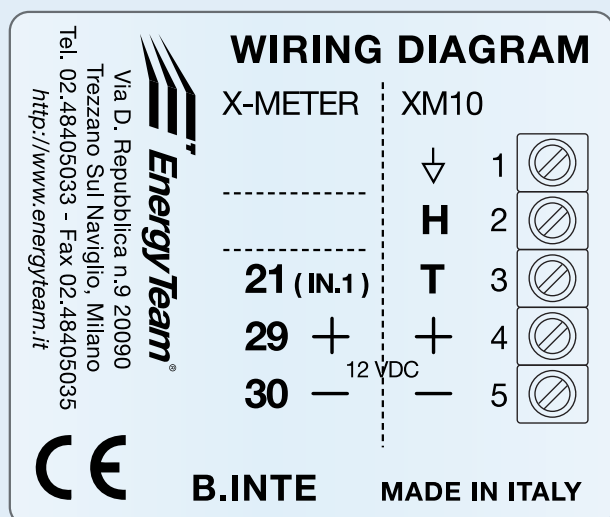
XM11 module equipment and features
The module has two LEDs on the front panel:
> The **RED LED** is located on the front panel and flashes with every output impulse. It remains steady when the input measurement (one of the measurements) exceeds the range given above.
> The steady **GREEN LED** indicates that the device is in operation.

Applications

In combination with devices like the X-Meter/RWU it allows the acquisition of room temperatures in offices, CED, warehouses, shopping centres, etc.

Technical data

Power supply	12 Vdc
Consumption	0.85 W / 71 mA
Temperature measurement range	-10+65 °C
Accuracy of the Temperature meas.	±0.3/±0.8 °C
Humidity measurement range	0% to 100%
Accuracy of the Humidity meas.	±2%
Screw terminal board Max cable dim.	0.5 mm²
Type of pulsed output	0/5 Hz
Weight	50 gr
Width	64 mm
Height	76 mm
Depth	26 mm
Protection rating	IP20
Container type	plastic

WIRING DIAGRAM

X-METER | XM11

EnergyTeam
Via D. Repubblica n.9 20090 Trezzano Sul Naviglio, Milano
Tel. 02.48405033 - Fax 02.48405035
http://www.energyteam.it

B.INTE   MADE IN ITALY
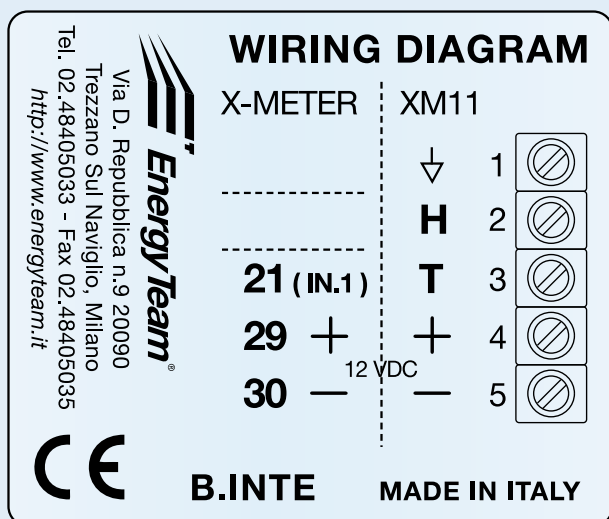
Pulses
Pulsed output negative terminal*
> for X-Meter, terminal 30
> forRWU terminals C1/2/3

H Pulsed output positive terminal
> for X-Meter terminals from 21 to 28
> For RWU terminals EA-ER-SE-G SG-W not used

T Pulsed output positive terminal
> for X-Meter terminals from 21 to 28
> for RWU terminals EA-ER-SE-G SG-W

- + Power supply 12 Vcc
The X-Meter device can supply up to 2 modules (XM8-9-10) on terminals 29 (+) and 30 (-).

* connected inside the terminal

XM15
Load interface relay module

Technical data

Hardware	
Power supply	230 VAC ±6%
Protection on Pwr Sup.	Fuse 5x20R, 50mA
Consumption	2.6VA MAX
Operating range	-10°C+50°C
Galv. Isolation Output	250V
No. outputs	4 relay 1 interchange-C,NC,NO
Max Switched Current	16A for each interchange
Protection on C. Switch.	275V
Guaranteed number of cycles	100.000
Type of control	Electronic / Man.
Signalling	LED
Mechanical	
Case	Flame retardant plastic
Protection rating	IP40 (front)
Dimensions	6TE 108 mm X 58 mm H
Installation	On DIN rail
Terminals	On screw terminals
Max cable section relay output	2.5 mm^2
Weight	350 gr
Relay Installation	CS Base
Terminal board type	Removable Polarized
Operation test	Manual
Usage conditions	
Operating temperature	-20 °C +65 °C
Relative humidity	90% non-condensing
Directives Applied	
	EMC 89/336/EEC
	Emissions EN 50081-1 1992
	EN5022 CL.B
	Immunity EN50082-1 1992
	Safety EN61010

The X-Meter offers 4 ON-OFF output activators able to drive 4 outputs at a maximum voltage of 24Vac/Vdc and maximum current of 100mA each. To use these outputs to drive standard loads in a 220Vac single phase network, they must be interfaced to the XM15 module.

This module supplied with 220Vac single-phase voltage makes 4 totally independent relays available (one for each X-Meter output) each with the capacity to switch a load of 250Vac and current of 16A.

For each relay all three of the single interchange contacts (C, NC, NO) are available in output (terminal board) with two protection converters (275V) for voltage surge at the contacts. Plus, each of the 4 relays on the XM15 module has a LED to indicate when it is active (or when the corresponding output on the X-Meter is active) and a manual test button for switching the interchange.
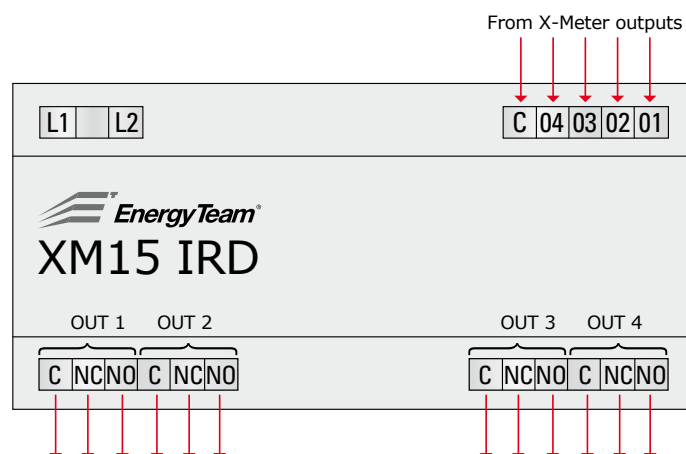
Options
XM UPS
Micro UPS for X-Meter
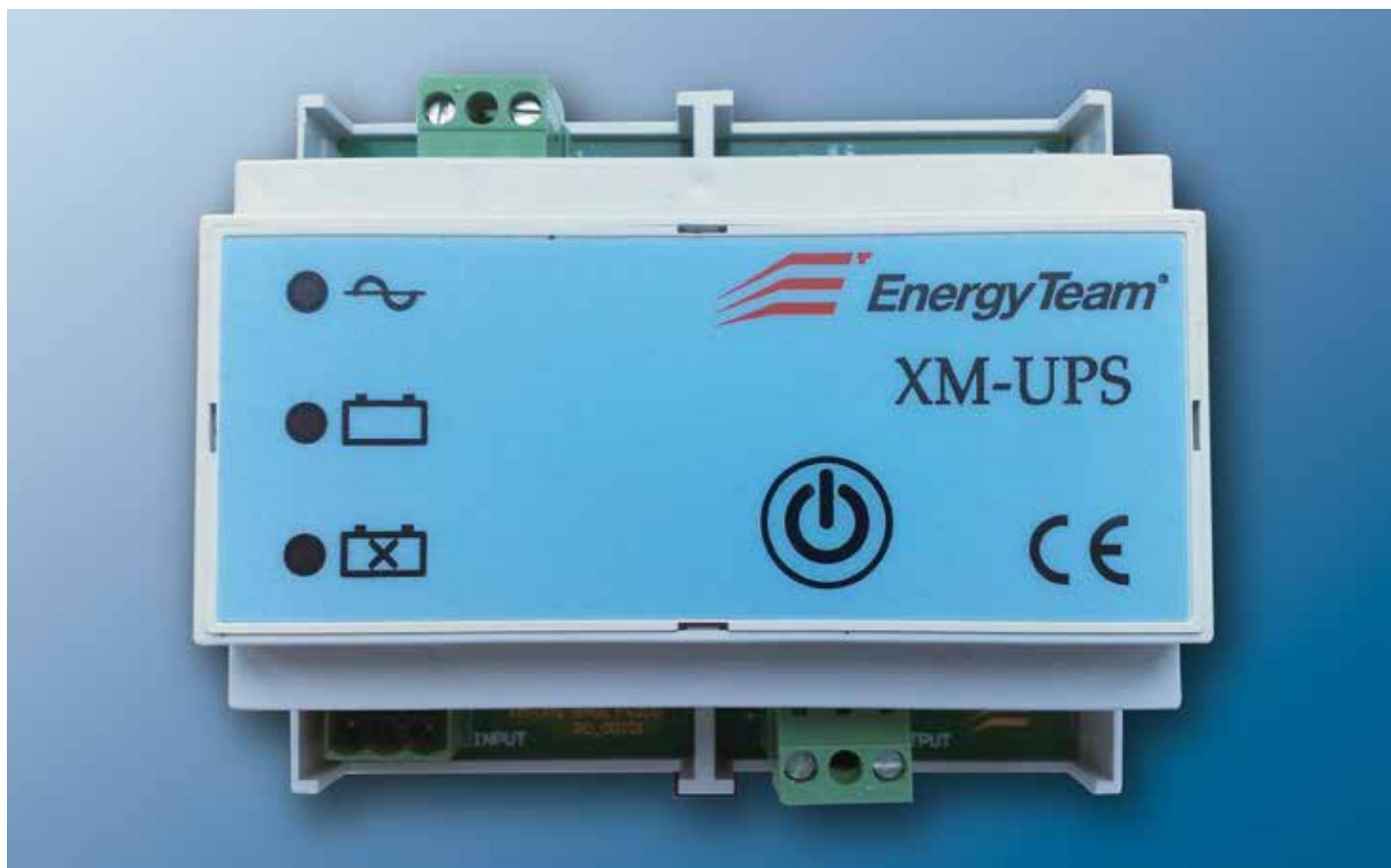
Extremely small backup power supply with cutting edge batteries (lithium polymer) to supply an X-Meter device up to a maximum of 4 hours.

> Lithium polymer batteries offer not only an excellent capacity-weight-size ratio but also allow for extremely low self-discharge, supplying power even after days without electricity.
> 3 LEDs on the front panel and an internal buzzer to signal all primary operation information.
> A front button that can be used to enable or disable the output
> During power failures, the UPS will signal Auto-off after 5 minutes. During this period of time it is possible to extend battery operation indefinitely by simply pressing the front button (function can be disabled).
> Internal protection against output short circuit, output overload and various anomalies related to the internal batteries and overheating.
> Analogue output can be interfaced with the X-Meter device to be able tosend information to the user when there is a UPS anomaly or power failure.

Technical data

Information and Functionality	
Network present - absent	V
Battery charging	V
Low battery	V
Battery fully charged	V
Pwr supply output enabled/disabled	V
Anomalies present	V
Timed Auto-off can be configured	V
Power Supply in AC and DC	85V/265V
Battery life	4 hours for one X-Meter
Output voltage	200 Vdc
Max applicable load	6.5 W
Maximum consumption	10VA
Visual signal	3 LEDs and internal buzzer
Mechanical	
Case	Flame retardant plastic
Protection rating	IP40 (front)
Dimensions	6TE 108 mm X 58 mm H
Installation	On DIN rail
Terminal board type	Removable, polarized with screw terminals
Max cable section output	2.0 mm^2
Weight	200 gr
Usage conditions	
Operating temperature	-10 °C +60 °C
Relative humidity	90% non-condensing

GSL-C Radio receiver module
For Solar Irradiation and Temperature Sensors

The GSL-C module receives via radio the measurements carried out by a family of compatible transmitter sensors. The measurements received are then produced onto digital outputs. Each measurement received corresponds to a channel on the output. This module is able to process up to 4 channels. It also implements the warning signal when the remote sensors indicate that the battery is low. This occurs a few weeks before complete discharge. It is compatible with the GSL-IT-W transmitter sensor.

Technical data

General	
Dimensions	64x76x26 mm
Weight	50 grams
Case material	ABS
Protection rating	IP20
Power supply	+12 ÷ +24 Vdc
Operating temperature	-10°C ÷ +65°C
Relative humidity	95% non-condensing
Radio signal reception	
Range	300 meters in open field
Digital outputs	Frequency: 0 ÷ 5 Hz
Pulse duration	100 ms.
Maximum voltage	30 Vdc
Maximum current	50 mA

GSL-P-W

Module for pulse radio-transmission and recording

The GSL-P-W pulse recorder allows acquisition and radio frequency pulse transmission up to 300 meters in open-field, to a GSL-C receiver/gateway using any source of pulses, coming from different meters (Electrical energy, gas, water, steam, etc). The GSL-P-W can be configured to read pulsed coming from a potential-free contact source, without voltage, or directly from a photodiode by reading the LED on the fiscal meter (through the optional probe). The GSL-P-W is equipped with an internal battery. It is also possible to use an external, low voltage power supply.

Technical data

General	
Dimensions	120x80x45 mm
Weight	320 grams, including battery
Case material	Polycarbonate for the case, polyamide for the accessories
Protection rating	Standard: IP65; Option with photodiode: IP20
Power supply	- 1st option: internal lithium battery; life 5 years with one transmission per minute. - 2nd option: 9 ÷ 24 Vdc/ac external, 100 mA
Operating temperature	-20°C ÷ +70°C
Relative humidity	100% with IP65; 90% with IP20
Other features	It includes an anticondensation
Optional accessories	External probe with photodiode that can be connected using an RCA connector; cable L = 50 cm. Velcro sheet 14x22mm for ENEL meters. Velcro sheet 26x28mm for non-ENEL meters.
Connection	
Standard	Waterproof cable gland with internal terminal board
Photodiode option	Internal socket for RCA
Radio	
Range	300 meters in open field
Frequency	868 MHz

Compact Directional Antenna

The Compact Directional Antenna offers a high gain in the direction of the Base Station, allowing connection at long distances.

The small dimensions and low environmental impact make it a perfect solution for outdoor use in GSM Dual Band at 900 and 1800 MHz, DECT and for third generation devices.

12.5 m coaxial extension cables are available upon request.

Technical data

Gain	9.0 dBi
VSWR in band	< 2:1
Polarization	vertical
Connector	male SMA (others upon request)
Use	indoors/outdoors
Cable	low loss (5m standard, others upon request)

XM2-B BRIDGE USB-RS485

Collegamento

USB

RS485
(up to 150 m.)

The module can be used to convert the 485 signal coming from the X-Meter to the USB port on a Personal Computer. Galvanic isolation of the USB connection ensures maximum protection of the PC from disturbances or voltage surges coming from the field. Designed with industrial features. No bulky external power supply is needed as it is self-powered.

Technical data

Power supply	Self-powered
Insulation	2.5 kV
Visual indicators	Power, Act, TX, RX
USB Cable	2m included
Dimensions	39x19x21 mm
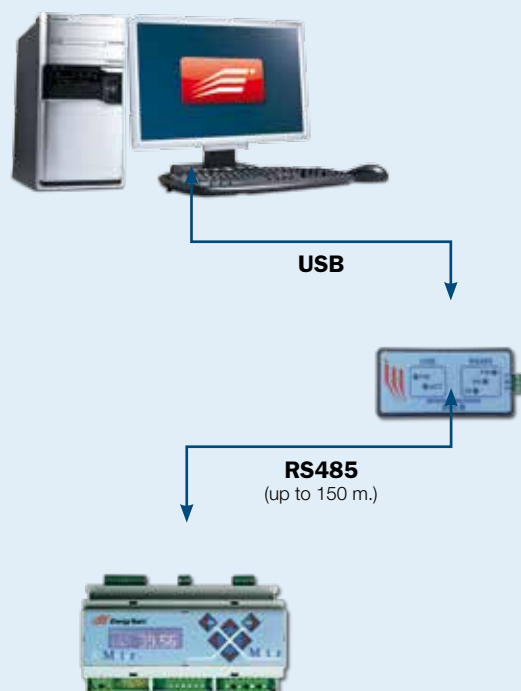
Rogowski Current Probes

The Rogowski coil is an electrical device for the measurement of alternating current or pulsed type currents. The main advantage of a Rogowski coil compared to other measuring methods (current or HV transformers, Hall sensors, etc.) lies in it being open-ended and flexible allowing it to be wound around a live conductor without disturbingit.

Plus, since a Rogowski coil does not have an iron core, it has low inductance which allows the measurement of rapidly changing currents that vary over time.

Technical data

Current collector	
Sensor	Flexible and operable
Practical tightening diameter	100mm or 200mm
Output cable	2m shielded
Precision	Class 1
Rogowski Amplifier	
Type	Single/Three-phase measurement (from 1 to 3 sensors)
Full-scale output capacities with diameter 100	62,5,125,250,500,1000 and 2000 A Opt. double scale 125,250,500,1000,2000,4000 A
Power supply	12 Vdc
Container	4 DIN module plastic rail
Connection	Removable terminals
Use	With X-meters modified with live current inputs
Precision	Class 1
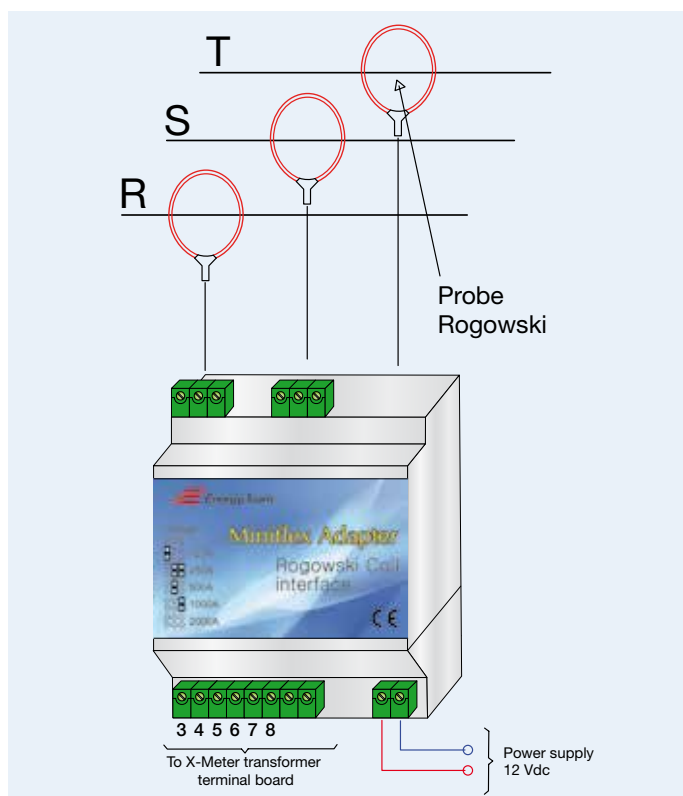
Openable current transformer with voltage output

CODE Item Energy Team	Internal Dimensions Pass-through (mm) [Ø]	External Dimensions (mm) [WxHxD]	Full scale (A)	Class
8192TA	24	46 x 66 x 34,2	50	1
8193TA	24	46 x 66 x 34,2	100	1
8197TA	24	46 x 66 x 34,2	150	1

Accessories for meters

Short-circuitable terminal boards
For energy meter attachment
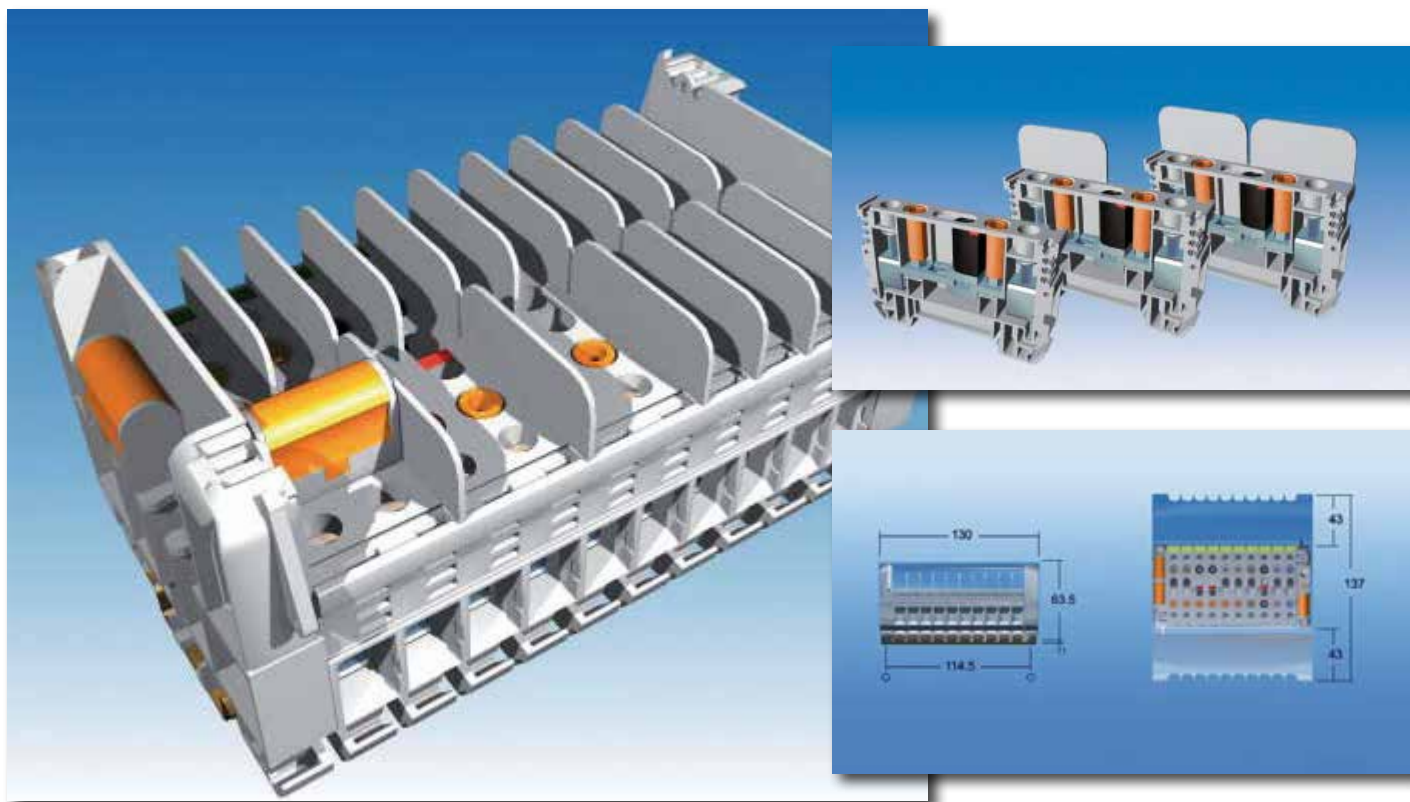
The 10E 6I-4T-EPI short-circuitable terminal board is an indispensable tool for attaching meters or measuring instruments on three-phase lines downstream from voltage and current transformers. It is equipped with 10 clamps that are fully segmented longitudinally (between input and output) with sliding bridges contained in the block and able to integrate a visual signal in case of open circuit. In addition, another three sliding bridges are available for releasing the "cross connection" (between a terminal block and the next one) in order to make a local short-circuit for the current circuits. The terminal board was designed to meet the requirements of the new version of Standard EN 60947-7-x.

The following can be created using the terminal boards:
> Sectioning of measurement instruments
> Insertion of a sample unit, before or after the measurement instrument.
> Derivation using common outlets for all connection clamps
> Step voltage from current input to the crimper through a jumper to be prepared.

During normal operation, the voltage and current inputs are inserted on the lower, respectively, of clamps 1-2-3-N and clamps R-RR, S-SS, T-TT.

The instruments are connected to the high part of the terminal board. The vertical sliding bridges are closed while the ones with a horizontal slide are open.

Inserting control units is done as follows:
> The volt meters are derived through normal 4mm pins on terminals 1-2-3 and N
> The measurement device ammeter R is inserted on the two sockets on terminal R (and similarly for the other phases)
> The corresponding vertical sliding terminals are sectioned

Technical data according to EN 60947-7

Nominal insulating voltage	800 V
Impulse withstanding	8 kV CAT IV
Maximum longitudinal current	76 A
Maximum transversal current	from 14A (@ 60 °C) to 32A (@ 30 °C)
Maximum cable section	1 x 16mm ≤ or 2 x 6mm ≤
Space between terminals	10.5 mm
socket section	4 mm
Dimensions (mm)	128 x 67 x 61.5
Protection rating	IP20
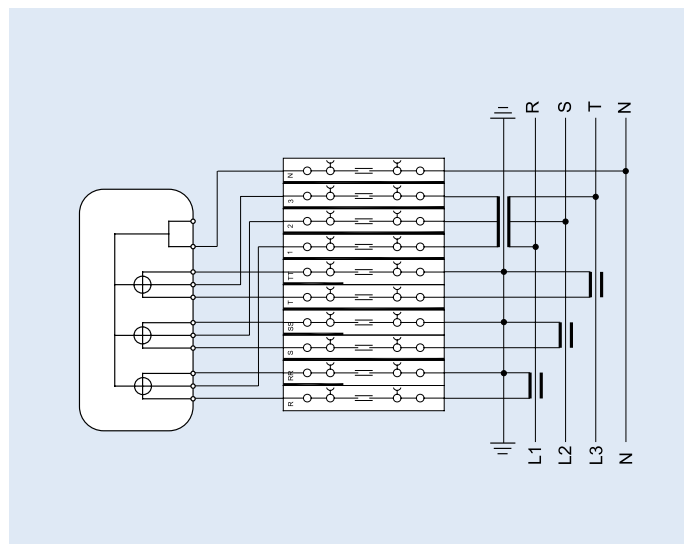
Electricity

Meter for Tax Use

The SL7000 meter is a complete and extremely versatile system for measuring electricity. It can be used (even for tax purposes) by commercial, industrial or substation users.

Various input/output options and communication ports are available (IEC61107 standard optical and RS232/RS485 standard electrical) The SL7000 ACE is also compatible with various communication methods (PSTN, GPRS, IP...) to ensure adaptability with existing infrastructure and thus reducedata collection costs. For photovoltaic systems, is it ideal for being telemetered by the GSE.

The meter performs energy measurements of maximum power and measurements related to the service quality as well as recording the load curves. The level of voltage quality and diagnostic events are logged, including all data, time and duration in a FIFO table with a capacity of 500 events. The historic measurement data are logged in a set of non-volatile records.

Up to 8 fee bands are supported that can be independently assigned to10 energy channels and 10 power channels. This allows the description of 24 daily profiles together with 16 hourly switching possibilities and 100 special exclusion days. The external control signals can also be used to activate the fee bands.

A three-phase redundant power supply (auto-ranging from 3x57.7/100 V to 3x240/415V) together with a measurement dynamic that is extremely wide-ranging (up to 1200%) allows the use of a single type of meter in various installation conditions. From the practical point of view, use of the meter must be derived from the volt circuits (TV) and current circuits (TC) and this is possible using the practical short-circuitable terminal board that was previously described.

Dimensions
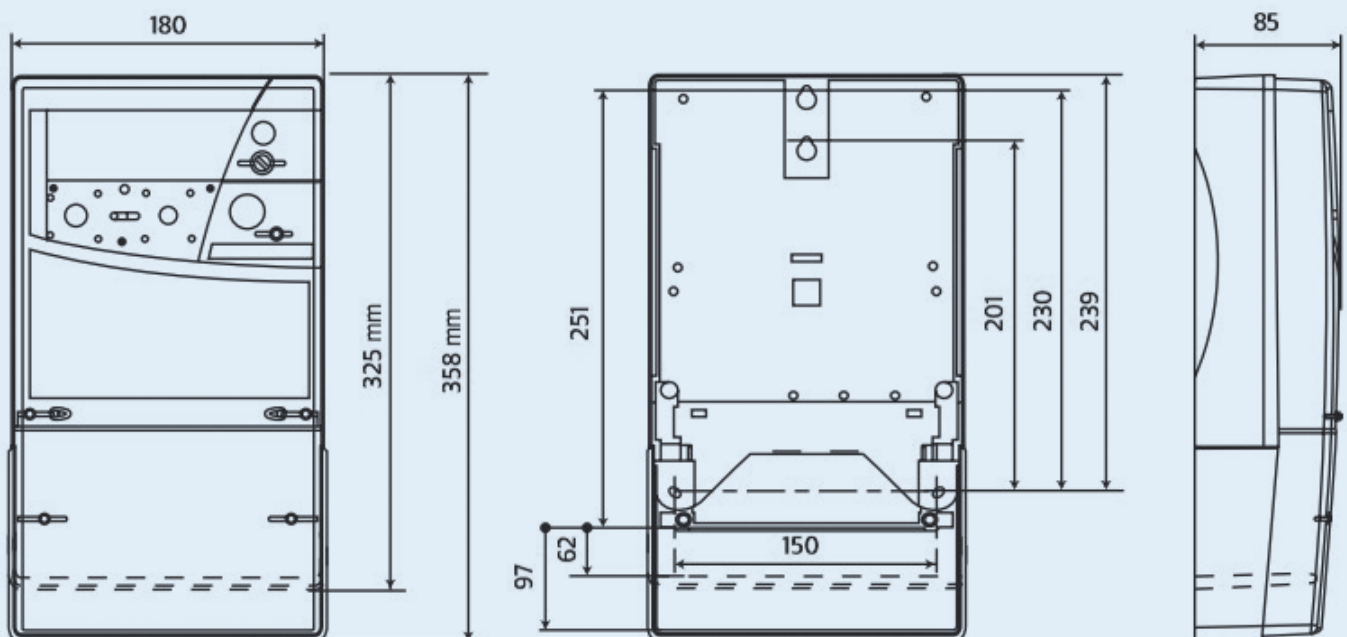
Meters

XMC3F ID
Direct insertion electronic meter

Technical data

Nominal voltage	3 x 220V/380V
Nominal Current	3 x 20(100)A
Frequency	50-60Hz
Connection	Direct (up to 80A)
Display	LCD 6+2=999999.99kWh
Precision	1.0
Minimum current	0.004 x Ib
Number output impulses	800 imp/kWh
Working temperature	-20°C +55°C
Consumption	1W
Dimensions (mm)	100 x 76 x 65 (about 5 DIN modules)
Weight	0.5 kg
Relative humidity	<90% non-condensing

Meters

XMC3F-M
Direct insertion electronic meter

Dati tecnici

Tensione nominale	3 x 230V/400V
Corrente Nominale	5A
Frequenza	50-60Hz
Connessione	Diretta (fino a 5A)
Numeratore	999999.9 kWh
Precisione	Classe A
Corrente minima	15 mA
Numero impulsi uscita	800 imp/kWh
Temperatura di lavoro	-10°C +40°C
Consumo	1VA/3VA per ogni fase
Dimesioni (mm)	70 x 85 x 63 (4 moduli DIN)
Peso	0.6 kg
Umidità relativa	<90% senza condensa

Meters

Other meters

Water and Liquids

There is a line of measuring devices with single jet, multi-jet, WOLT-MANN type meter for hot or cold water, fully protected wet or dry face and all provided with impulse emitters or even just ready for telemetering with X-Meter or XRWU-GOLD. The diameters available range from DN13 to DN50 for single jet or multiple jet models and from DN50 to DN300 for meter models. The liters/impulse ratio varies from 0.25 to 1000 (to be specified in advance). All models are MID approved according to Directive 2004/22/EC (module B+D) in compliance with EN 14154/2007 and OIML R49/2006. They are certified for use with drinking water according to DM 174 dated April 6, 2004. The following are also available:

> Electromagnetic capacity meters with diameters from 25 to 2000 mm, precision 0.2%, Max temperature 180°C and pressure up to 300 bars

> PTB and MID certified calorie counters. Thermal power up to 30,000 MW with precision >0.5%.

Gas

A wide range of turbine meters and quantometers is available. Q with body in cast iron, steel or aluminium (based on pressure) and IP67 protection rating. All devices are equipped with impulse emitters for telemetering with X-Meter or XRWU-GOLD. The turbine models are fiscal flow meters that detect the volume of gas in cubic meters with pressures that range from PN10 to PN100. The diameters available range from DN50 to DN600 with sizes from G65 to G16000. Perforated plate flow conditioners can be incorporated and they are lubricated with oil.

The quantometers are non-fiscal gas meters that are very safe for the wide range of capacity and operate on the turbine principle. The rotation of the impeller is proportional to the gas flow and is recorded (Vb/m3) through a mechanical (QA) or electronic (QAe) counter. The self-greasing bearings ensure perfect operation of the quantometer that is thus maintenance-free. Beside recording the total volume (Vb/m3), the QAe allows the display of the instantaneous flow (Qb/m3/h) and the volume at a set date. The diameters available range from DN25 to DN500 with sizes from G10 to G16000. The pressures range from 1 to 100 bars based on the type of gas and the model. A removable version is also available that is mounted on a special flanged adaptor.

Steam

The vortex flow meters are based on the Karman principle and are used in various industrial sectors. They are particularly widespread for the measurement and recording of steam. The versatility of these instruments is unbeatable since they help resolve various problems in measuring the flow rate that normally exist inside a system. They are designed, built and tested according to the strictest ISO 9001 quality standards in order to ensure excellent performance at any time, from ideal laboratory conditions to the most critical industrial processes. They do not require maintenance since they have no moving parts. They offer various output possibilities (4-20mA, impulse, frequency, etc.). They allow the measurement of the process temperature between -200 to +400°C with nominal pressures up to PN250/Class 1500 and can be approved for use in ATEX type hazardous areas. They have a wide range of nominal diameters, from DN 15 to DN300 and are equipped with built-in temperature sensor for calculating the mass flow rate and heat.

Meters

ET-MS2500/ET-ML110
Electromagnetic meter with separate electronics

The **ET-MS2500** flanged Electromagnetic Sensor is a flow rate meter for liquids and electrically conductive volumes, caustic substances and mixed liquids and solids.
Its primary features are the absence of moving mechanical parts and internal electrical insulation. These allow minimum load losses, prevent extraordinary maintenance due to possible damage caused by solid debris and obtain extremely precise measurements since it is not influenced by physical parameters like temperature, density and viscosity of the liquid.

The management of the signal generated by the electrodes on the meter is done by the **ET-ML110** convertor which allows very accurate measurements with stable performance over time in a wide range of flow rates. The possibility of installing the converter in separate mode compared to the meter makes installation easy even in the most restricted areas. Allmodels come with pulsed output.
Upon request, the Electromagnetic Meter and Converter can be provided with MID004 certification (compliant with EN1434 according to European Directive 2004/22EG). These features make ET-MS2500 and ET-ML110 suitable for various sectors.

Technical Data ET-MS2500

Body material	Painted carbon steel AISI 304 or 316 Stainless steel
Nominal diameters	DN 25 ÷ 2000
Nominal pressure	PN 16 Others upon request
Process attachments	Flange: UNI, ANSI, DIN, JIS Others upon
Flange material	Carbon steel AISI 304 or 316 Stainless steel
Liquid temperature	0°C ÷ 60°C with PP coating -5°C ÷ 80°C with hard rubber coating -20°C ÷ 100°C with PTFE coating compact version -20°C ÷ 130°C with PTFE coating separate version* *Contact the manufacturer for higher temperatures
Vacuum resistance	20 Kpa (absolute) at 100 °C (60/80°C for PP/hard rubber)
Coating material	Polypropylene (max. PN 16) Hard rubber PTFE Others upon request
Gasket material	No gasket vers. Lining PTFE-EBNITE FPM with lining in Polypropylene
Electrode material	AISI 316 Stainless steel Hastelloy B or C Platinum-Rhodium Titanium Tantalum Others upon request
Version - protection rating	Compact - IP 67 Separate (maximum 20m) - IP 68 Separate (maximum 500m) with pre-amplifier - IP 67 (IP 68 optional)

Technical Data ET-ML110

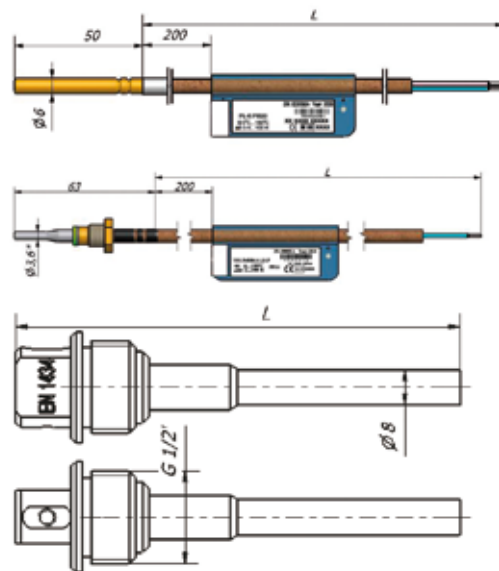|	
Case material	Nylon loaded fibreglass
Dimensions	120x120x55 mm
Protection rating	IP 65
Cables - Cable glands	Cable C018 (max. 20m) Standard no. 3 PG 11
Environmental temperature	0...+50 °C
LCD Display	Alphanumeric display with 16 characters and 2 unlit lines
Keyboard for programming	3 internal keys
Impulse output/frequency/alarms	2 programmable functions max 1250 Hz, 100mA, 40 Vdc
Output in current	n° 1 0/4...20mA - RL 800 Ω
Bidirectional measurement	YES
FS value	0,4...10m/s
Self-diagnostic function	YES
Empty pipe detection	YES
Galvanic separation	All outputs are separate from each other and from the power supply
Data logging	When there is a power outage the data is logged in an Eeprom
Programming outlet	Protected outlet for PC connection or laptop connection
EC Certification	EC certified instrument
Margin of error	Flow rate (volume) = ±0,1 % v.l. Out 4/20 mA = ±0,12 % v.l. Out Frequency = ±0,12 % v.l.
Repeatability	+/-0,2%
Power supply	90÷265 Vac - 45÷66 Hz; 10÷63 Vdc/15÷45 Vac - 45÷66 Hz
Consumption	5VA; 4VA (AC) / 3W max (AC)

ET-ML311
Thermal energy meter

The ET-ML311 meter was designed to measure the thermal energy consumed in centralized heating and cooling systems. The metering of physical heat is detected through an electronic reading of the quantity of water flowing through the meter (V) and the difference in temperature detected by the two high precision probes located one on the output flow and the other on the return flow (ΔT). These two parameters are multiplied by the heat coefficient of the heat transfer fluid used, enthalpy, (K), thus determining the Thermal Energy value.

E= V*K*ΔT

Small and compatible with all types of flow meters, Turbine meters, Woltmann meters, Ultrasound and Electromagnetic meters, it interfaces directly with PT100/500/1000 type 2 or 4 wire probes and determines the correct temperature value using the algorithm in EN60751. Thus it performs an extremely precise calculation of the heating and cooling consumption. Upon request, ET-ML311 can be certified for "financial transactions" and complies with EN1434 (MID004) according to European Directive 2004/22EG.

Technical data ET-ML311

Case	PPO sealable box
Protection rating	IP40/IP54 (with terminal covers)
Version	Stand-alone; Installation DIN rail (acc. DIN60715)
Display	4 lines x 15 characters (9 digit-total. 6 digit-istant.) backlit (blue upon request)
Language	6 programmable languages (I, E , S, F, D, P)
Special functions	Bi-directional; Double range; Diagnostic; Energy Saving; Hot-Cold Switch; Reset Inputs
Impulse outputs/Freq	Programmable functions/Open collector (2, 1250Hz, 100mA, 40Vdc - 12,5KHz opt.)
Digital/Analogue inputs	Programmable functions: 1 Analogue (Flow rate) 3 Impulses (Hot and cold, liquid and volume)
Current output	N°1, 0/4....20mA - RL=1000 (i.e. flow rate/power)
Serial port (opt)	RS232, RS485, MODBUS, BACnet MS/TP, M-bus, N2Open
Power supply	90÷265 Vac - 45÷66Hz or 18÷63Vdc/15÷45Vac - 45/66Hz optional
Precision	± 0,2%.v.l. Calculation update every second
Repeatability	Better than 0.1%

Technical data Sensors

|	
Wire connection	2 o 4 wire
Type of sensor	Pt500 (Pt 100 e Pt 1000 upon request)
Measuring	Temperature difference detected by the measurement of dual calibrated probes that are directly correlated to the quantity of thermal energy calculated by the meter to which they are connected
Difference measuring limits:	Temperature difference limits: Δ θ = 3.... 100K; 2.... 100K special limits: θ = 0.... 150 °K
Field of measurement	0 °C ... 150 °K (180 °C upon request)
Field of measurement of the temperature difference	3 °C... 100 °K
Max temperature allowable for heat transfer fluid	150 °C (180 °C upon request)
Tolerance class	B in compliance with EN 60751
Cable length for 2/4 wire connection	3m, 5m, 10m Greater length in version with tip to cable
Type of cable for 2 wire connection	2 × 0,5 mm² unshielded (permanent connection)
Type of cable for 4 wire connection	4 × 0,35 mm² unshielded (permanent connection)
Max RMS value of the sensor current	0,5 mA
Response time t0.5	< 10 s
Total resistance of the signal load	0,22 Ω - with 3m cable (2 wires) 0,36 Ω - with 5m cable (2 wires) 0,72 Ω - with 10m cable (4 wires)
Environmental parameters	Room temp +5°C... +55°C Mechanical environment class M1 Electromagnetic environment class E1

Meters

Corrector

Il convertitore di volumi di gas è un apparecchio elettronico di misura che provvede a convertire i volumi di gas "geometrici" rapportandoli al metro cubo standard, in funzione della pressione e della temperatura, al loro variare con il tempo. Compatto facile da installare e con una batteria di lunga durato il convertitore può essere usato come dispositivo autonomo o come gruppo di misura fiscale.

**THE INFRARED INTERFACE
MUST BE CONNECTED TO THE PC**

TZ Converter — Temperature sensor

PTZ Converter — Pressure sensor — Temperature sensor
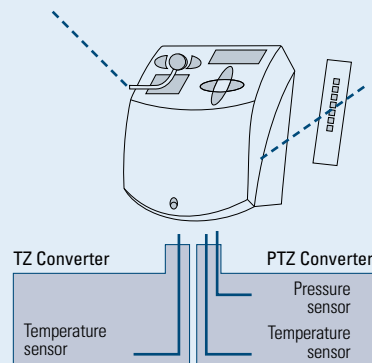
Optional cards
a) Power supply - 230 VAC
b) HF input (a+b) with error curve correction
c) Analogue outputs
d) Analogue inputs (4-20mA per P and T)
e) Analogue inputs for meter orifice ISO5167
f) communication port for GSM/GPRS/PSTN modem, connection to DCS and various protocols
g) PSTN modem
h) GSM/GPRS modem
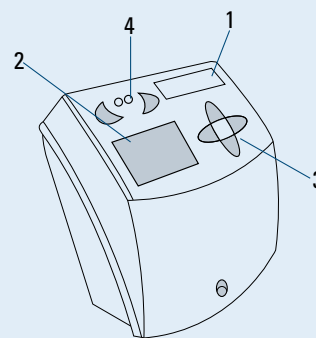
1) LCD Display (8 figures). Indicates the correct volume and other primary parameters.
2) Graphic display, configurable from the menu control (8 lines of 21 characters each).
3) Scroll key for the Display
4) Infrared interface, ISO 1107 compliant

Technical data

Pressure ranges (Bar A)	0-6 # 3-14 # 8-30 # 20-80
Temperature range	-40°C a +70°C (gas e temperatura ambiente)
Inputs and outputs (standard version without optional cards) Gas meter Alarms Pulsed outputs Alarm output Serial Ports	2 LF inputs (dual control) 1 input 2 configurable 1 1 optical (ISO 1107) 1 serial (2 wire half duplex), RS-232 connection upon request, MODBUS protocol
Precision	In compliance with EN12405, less than 0.2% on the entire pressure measurement and room temperature range
Power supply	Lithium battery with 15 year life under normal conditions. The battery can function as an emergency backup Optional 230 VAC power supply in separate ATEX certified case
Datalogger	Recording capacity, 136 days, expandable
Z Calculation	AGA 8, SGERG-88, AGA NX 19 G9 (PTB)
Case	IP 65
Approvals	< 0,1%
Analogue output	in compliance with EN-12405 and MID 2004/22/EC
ATEX approval	Classification: Ex II2(1)G Eexib[ia]IIB T3 An additional special card for communication can be installed in hazardous areas inside the converter for connection to a modem (GSM/GPRS or PSTN). In safe areas supplied by battery, solar panel or 230 VAC. Ready for connection to the industrial telemetering device in compliance with ARG/gas 155/2008 and compliant with technical specifications UNI-TS 11291
Software	Programming on Windows operating system for reading and allocation of data. All primary data can be seen on the front panel. Menu customization

ET Flow Sensor

Single probe for **Compressed Air** Flow Rate - Pressure - Temperature
Model suitable for installation with **dry and filtered compressed air**

Technical data

Flow Sensor	
Measurement principle	Thermal Mass
Measurement Range	0(0,5)……150 m/sec.
Precision	2% on calibration value
Reference Conditions	0°C, 1013,25 mbar
Compressed gas temperature range	0…….+ 60°C
Gas	Compressed Air, Nitrogen and Inert Gases, non-condensing Gases
Pressure sensor	
Pressure Range	0…..16 bar
Precision	+/- 1,5 % FSS Compensated
Temperature sensor	
Temperature Range	0…….+60°C
Precision	> 10 m/sec +/- 1°C < 10 m/sec + 5°C
Data Outputs	
4-20 mA	(opz.) MODBUS RTU
Mechanical/ Room	
Length	400 mm
Attachments	G ½"
Pressure Range	PN 20 (greater pressures upon request)
Protection rating	IP52 display, IP63 connector
Room temperature range	-10°C……+50°C
Construction	Stainless Steel Anodized Aluminium - Silicone
Electrical connections	
Connector	M 12,5 pin female
Power supply voltage	12……24 VDC +/- 10% Class (UL)
Energy Consumption	2,4 Watt (no flow) 4,8 Watt (full flow) +/-10%
Power Supply	24 VDC
Connection cable	provided, 5m with M 12 connector; (opt.) 10m
Safety cable for anchoring	included
Calibration certificate	included

45 mm   ⌀ 12,70 mm

120 mm   P400: 390 mm

Standard 40 card for carbon steel pipes						
Size (inch)	DN	ID (mm)	Min flow (scfm)	Max flow (scfm)	Min flow (m^3_n/hr)	Max flow (m^3_n/hr)
2	50	52,5	2	688	4	1169
3	80	77,9	5	1516	9	2576
4	100	102,3	9	2610	15	4435
6	150	154,1	20	5924	34	10065
8	200	202,7	34	10259	58	17429
10	250	259,1	56	16756	95	28468
12	300	303,2	77	22953	130	38995
16	400	381,0	121	36237	205	61565
20	500	477,8	190	56996	323	96832

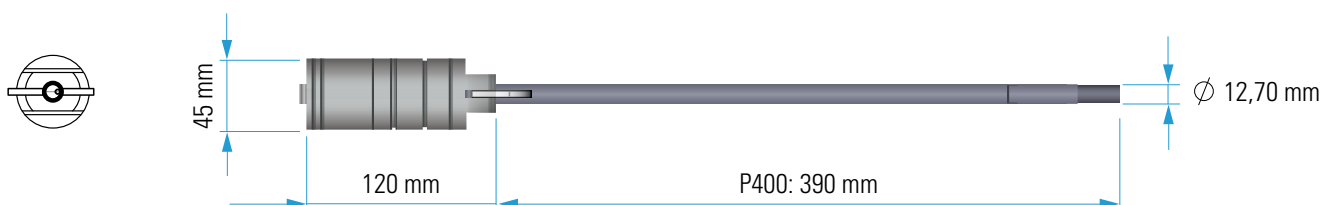| Standard 10 card for carbon steel pipes			
ID (inch)	ID (mm)	Min flow (m^3_n/hr)	Max flow (m^3_n/hr)
2,2	54,8	4	1273
3,3	82,8	10	2908
4,3	108,2	17	4966
6,4	161,5	37	11057
8,3	211,6	63	18982
10,4	264,7	99	29709
12,4	314,7	140	42004
15,6	396,8	223	66794
19,6	496,9	349	104729

Meters

ET Flow Sensor DP

Single probe for **untreated Compressed Air** Flow Rate - Pressure - Temperature
Model suitable for installation with **untreated compressed air resistant to condensation coming from the compressors**

Technical data

Flow Sensor	
Measurement principle	Measurement Range
Measurement Range	20……200 m/sec.
Precision	2% on calibration value
Reference Conditions	0°C
Compressed gas temperature range	0…….+ 60°C
Gas	Humid compressed air, dry compressed air, nitrogen and inert gases
Pressure sensor	
Pressure Range	0…..16 bar
Precision	+/- 0,1% FSS Compensated
Temperature sensor	
Temperature Range	- 40…….+150°C
Precision	+/- 1°C
Data Outputs	
4-20 mA	(opz.) MODBUS RTU
Mechanical/ Room	
Length	400 mm
Attachments	Threaded fitting with PTFE bushing G ½"
Pressure Range	PN 20 (greater pressures upon request)
Protection rating	IP63 connector
Room temperature range	-10°C……+50°C
Construction	Stainless Steel Anodized Aluminium - Silicone
Electrical connections	
Connector	M 12,5 pin female
Power supply voltage	12……24 VDC +/- 10% Class (UL)
Energy Consumption	1 Watt ; 50 mA
Power Supply	24 VDC

Connection cable	provided, 5m with M 12 connector; (opt.) 10m
Safety cable for anchoring	included
Calibration certificate	included

45 mm

381 mm

521 mm
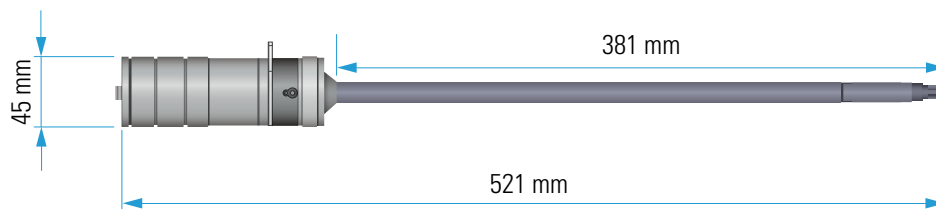
Standard 40 card for carbon steel pipes				
Size (inch)	DN	ID (mm)	Min flow (m^3_n/hr)	Max flow (m^3_n/hr)
2	50	52,5	156	1559
3	80	77,9	343	3434
4	100	102,3	591	5913
6	150	154,1	1342	13420
8	200	202,7	2324	23238
10	250	259,1	3796	37957
12	300	303,2	5199	51994
16	400	381,0	8209	82087
20	500	477,8	12911	129110

Standard 10 card for carbon steel pipes				
ID (inch)	ID (mm)		Min flow (m^3_n/hr)	Max flow (m^3_n/hr)
2,2	54,8		170	1697
3,3	82,8		388	3877
4,3	108,2		662	6621
6,4	161,5		1474	14743
8,3	211,6		2531	25309
10,4	264,7		3961	39612
12,4	314,7		5601	56006
15,6	396,8		8906	89058
19,6	496,9		13964	139638

Solutions and systems for energy efficiency

Data acquisition

ENE

TRANSFORMER 1

LAN

GSM ANTENNA

(GSM/GPRS or RS 485)

**RENE
SOU**

ELECTRICAL CABIN 1

EASY4HALL   CYCLOPS

LAN

(GSM/GPRS or RS 485)

AIR CONDITIONING	REFRIGERATION UNITUNIT	OVEN	MOTORS

XM9
Acquisition PT100

XM11
Temperature Humidity

Contatore
UTF

XM8
Analog
measurements

SMS @

**ACQUISITION OF: POWER, ENERGY, FLOW, TEMPERATURE, H
SENDING OF: ALARMS (STATUS AND THRESHOLDS ARE EXC**

OTHER UTILITIES

Water

Thermal energy

Gas

Steam

Air

Publishing data on the Web

RGY

DELIVERY LOCATION (GME)

TRANSFORMERS AMMETERS

SHORT-CIRCUITABLE TERMINAL BOARDS

Luce
Motori
Condizi

XM18
Load management

TRASFORMATORE 2

PT100

XM9

XM15
Extractor fan management

XM14
Power quality

WABLE
RCES

ELECTRICAL CABIN 2

XM UPS

LAN

(GSM/GPRS or RS 485)

LAN

SOLARIMETR

PHOTOVOLTAICS

OFFICE

LARGE DISTRIBUTION

LIGHTING

SERVERS

XM7
Programmable clocks

XM3
Digital imput

XMC3F
Meter

XM10
Temperature

(GSM/GPRS or RS 485)

SMS @

HUMIDITY, FLOW, STATES, ANALOG SIGNALS, DIGITAL SIGNALS.
CEEDED, DATA ACQUIRED, DRIVES (PLANAND THRESHOLDS)

SMS @

LAN

X-RWU

RWU for GME
Acquisition, Collection and analysis of electrical consumption from GME

X-RWU GOLD is a system designed for monitoring energy consumption detected by the Electronic Measurement Unit (GME). Through connection to the ES (Signal emission) interface inserted in the meter, it is possible to acquire information to detect the effective energy consumption at your location. In particular, the system receives from the GME, at a pulsed level, the following information:
> Active power acquired/delivered (A+ A-)
> Reactive power acquired/delivered (R+ R-)
> Band signals (also used for synchronism)
> The cosφ value of the system is also calculated indirectly.

The device, which has 8 digital inputs, acquires the impulses from the supplied measurements, logging them with the same archiving time criteria (15') and in perfect synchrony with the consumption band used by the GME. In fact, this method allows for the maximum possible precision. In fact, the measurement indirectly obtained from an pulsed system is not subject to class errors that are typically present in direct measurements.

The 4 outputs are completely manageable to:
> activate alarms upon reaching a certain level ofmeasurements acquired
> create load management logic linked to exceedingcontractual consumption. This progressively controls the opening or closing of the loads based on a manageable priority list (XM 15 XM 18)
> manage the start-up or shut-down of the utilities based on freely programmable clocks (option XM7).

Advantages
Check the correctness of consumption billed by energy suppliers. Remember that fiscal meters, not being up to date with the current fee levels, do not allow the user to verify the correct division of consumption for an individual band. Avoid exceeding the set power by managing the loads (with the XM15 XM18 option) for the purpose of:
> preventing the application of an increase in fixed power (transportationfees) for the current month, even for an occasional peak. In fact, the supplier bills these based on the highest 15 minutes of the month
> avoid paying the energy supplier fees for free grant hookups due to an occasional peak; thesefees are applied when exceeding the maximum available power
> use the most advantageous fee options based on the rules of the electrical market
> limit the costs of imbalance in the free market.
> reduce consumption in the most costly bands by timing load start-ups/shut-downs (with "clocks" option)
> log every amount measured by the instrument without the need-for a dedicated PC
> remotely send all of the archived measurement to a PC with various possibilitiesfor data processing and display.

The diagram shows how X-RWU GOLD can be connected to the GME meter and the outside world. The 5 free inputs in the most simple configuration can be used to acquire other measurements such as: Water, Gas, Steam, Compressed Air, Temperature 4-20mA, etc.
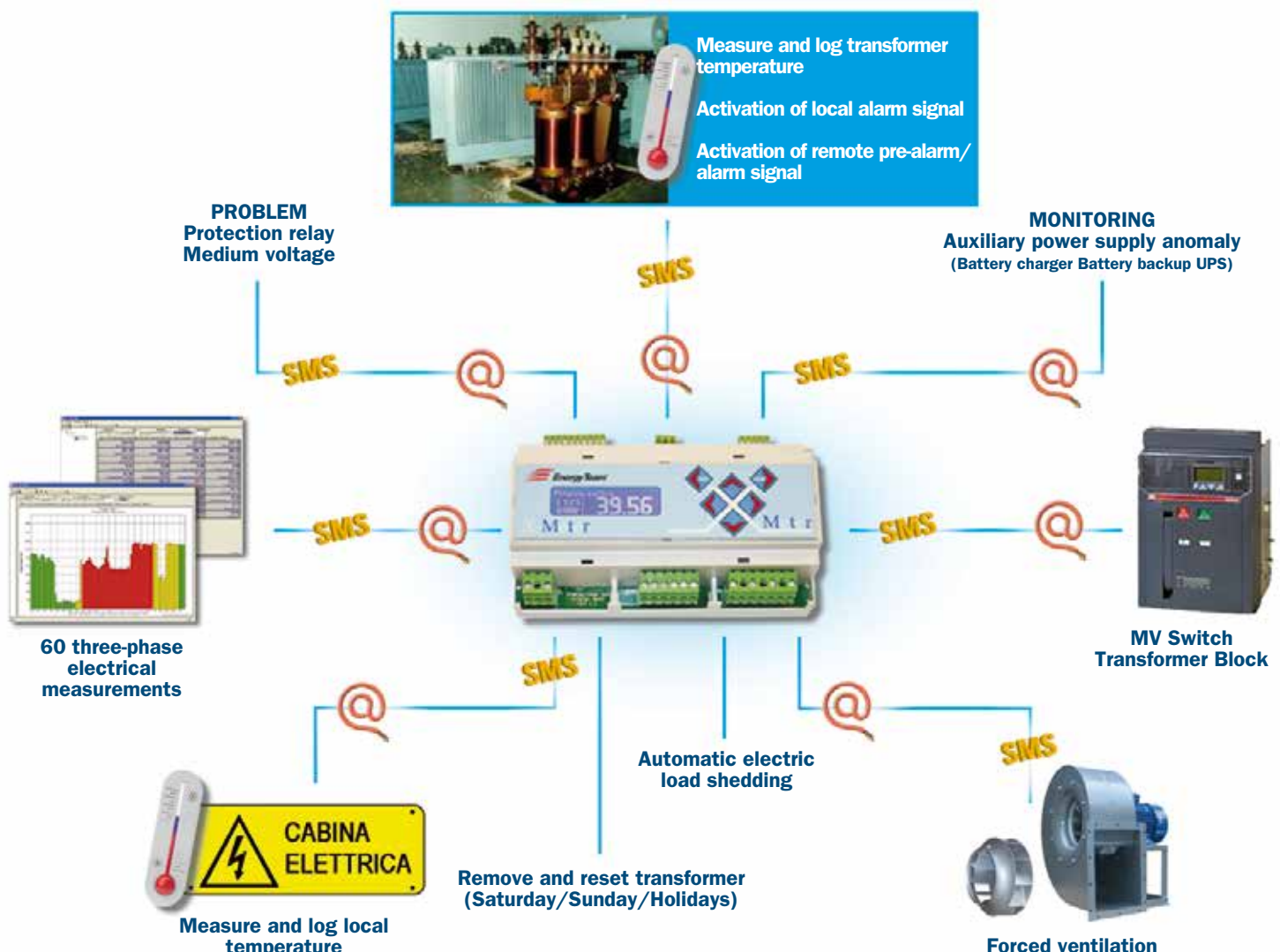
X-Meter for electric cabinet
Monitoring and alarms management system

The proper operation of a MV/LV transformer inside an electrical cabinet ensure the user against any failures that could cause production or processing lines to stop and much more.

It is therefore essential for the efficient and systematic control of the operating temperature of a transformer, and room temperature of the cabin, and the electrical parameters. The temperature is a direct index of the load conditions of the transformer and thus its operating condition. The thermal regime of a transformer depends on the output current, room temperature and auxiliary cooling ventilation conditions. The temperature is an element of stress and degradation, for resin insulation and a factor of chemical-physical alteration of the mineral oil insulation for oil transformers. These insulators in fact undergo a gradual ageing process that can be greatly accelerated if temperatures exceed certain set-point values normally found acceptable for proper operation. Operating a transformer at low loads means increasing energy loss, as operating a transformer at a power higher than 85% of its plate rating means dispelling a greater quantity of active energy percentage wise. Monitoring these situations means performing a series of considerations and interventions including the one for significant energy savings.

The X-Meter monitoring and alarms management and electrical factor monitoring system allows:

> Measurement and logging of the transformer temperature and activation of a local "high transformer temperature pre-alarm"
> Activate a local "high transformer temperature alarm signal
> Activate a remote signal (pre-alarm/cabin alarm).
> Activate a local visual audible alarm
> Activate the transformer block, opening the MV general transformer power supply switch on the medium voltage cabin panel
> Measure and log the transformer location temperature and activate local transformer supplementary ventilation (if available)
> Activate forced ventilation of the transformer cabin.
> Measure and log 60 electrical and harmonic parameters and micro-interruptions of electrical power of 10 ms
> Send an SMS to predefined numbers of the pre-alarm status or cabin alarm
> Send an email to predefined numbers of the cabin alarm status
> Activate a sequence of non-privileged load shedding (pre-defined by the user) upon reaching the high temperature pre-alarm setting.

Measure and log transformer temperature

Activation of local alarm signal

Activation of remote pre-alarm/alarm signal

PROBLEM
Protection relay
Medium voltage

MONITORING
Auxiliary power supply anomaly
(Battery charger Battery backup UPS)

60 three-phase
electrical
measurements

MV Switch
Transformer Block

CABINA
ELETTRICA

Automatic electric
load shedding

Measure and log local
temperature

Remove and reset transformer
(Saturday/Sunday/Holidays)

Forced ventilation

X-Meter Air

Is it possible to improve efficiency by 50%?

In an average sized company, the electricity needed to produce compressed air is generally a significant part of the total electricity needs.

By equipping the production facilities with compressed air management and monitoring systems designed for efficiency, it is possible to save even 40-50% of energy consumption compared to systems without this supervision technology.

The X-Meter Air monitoring system with its high modularity and expandability can be effectively implemented in both small systems (20-100 k" - 1-2 compressors) and large systems (>1000 kW - > 3 compressors). It allows the control of parameters such as:

> energy absorbed by the compressors
> production pressure
> network pressure
> air speed
> temperature and humidity

allowing the determination of the energy efficiency of the compressed air production process.

To summarize, the X-Meter Air systems allows:

> acquisition and analysis of OVER 50 electric factors
> measurement of the absorbed power of each individual compressor
> measurement of the compressed air production
> measurement of the pressure in the compressed air distribution network
> measurement of the volume of compressed air produced
> recording of compressed air consumption peaks
> recording of the temperature, humidity
> online connection to the system to check all operational parameters
> data and event logs

Analysis of all data acquired allows:

> verification of the effective yield of the compressors
> monitoring of the performance of the distribution network
> management of diagnostics and alarms
> signalling of any operational anomalies
> making data available online.

The "X-Meter Air" energy audit allows:

> production of audit certificates with real data
> performance of the compressor service parameter check-up
> calculation of the compressed air needed for the production process
> determination of the operational parameter logic
> diagnosis of any compressor operation anomalies
> evaluation of compressor maintenance savings
> measurement and localization of leaks
> calculation of the actual cost Wh/m3,
> calculation of the possible cost Wh/m3 (possible savings).

Custom solutions

The set of parameters obtained with the X-Meter Air, highlighting the higher degree of efficiency that can be obtained, allow the design of a new system or changes to the current one, providing useful estimates for budget planning relating to return on investment.

Web Solutions

The data coming from the field are integrated in a Business Intelligence platform capable of making complete and reliable consumption information (historic and real time) - in a single tool with a single database on a technological platform (DBMS) that is accessible online - according to pre-configurable interpretative logic.
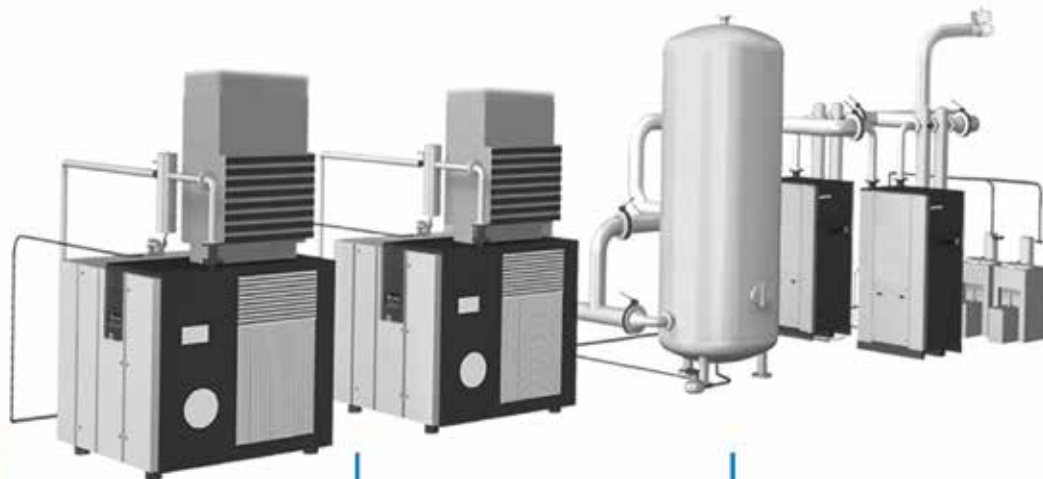
Compressor absorption   **Temperature and humidity**   **System pressure and flow**

X-Meter for CED room
Monitoring and alarms management system

Discovering in the morning that the servers in the CED room are down is an experience that workers (and others) hope not to encounter! The damage can be considerable, in addition to that derived from not being able to operate.
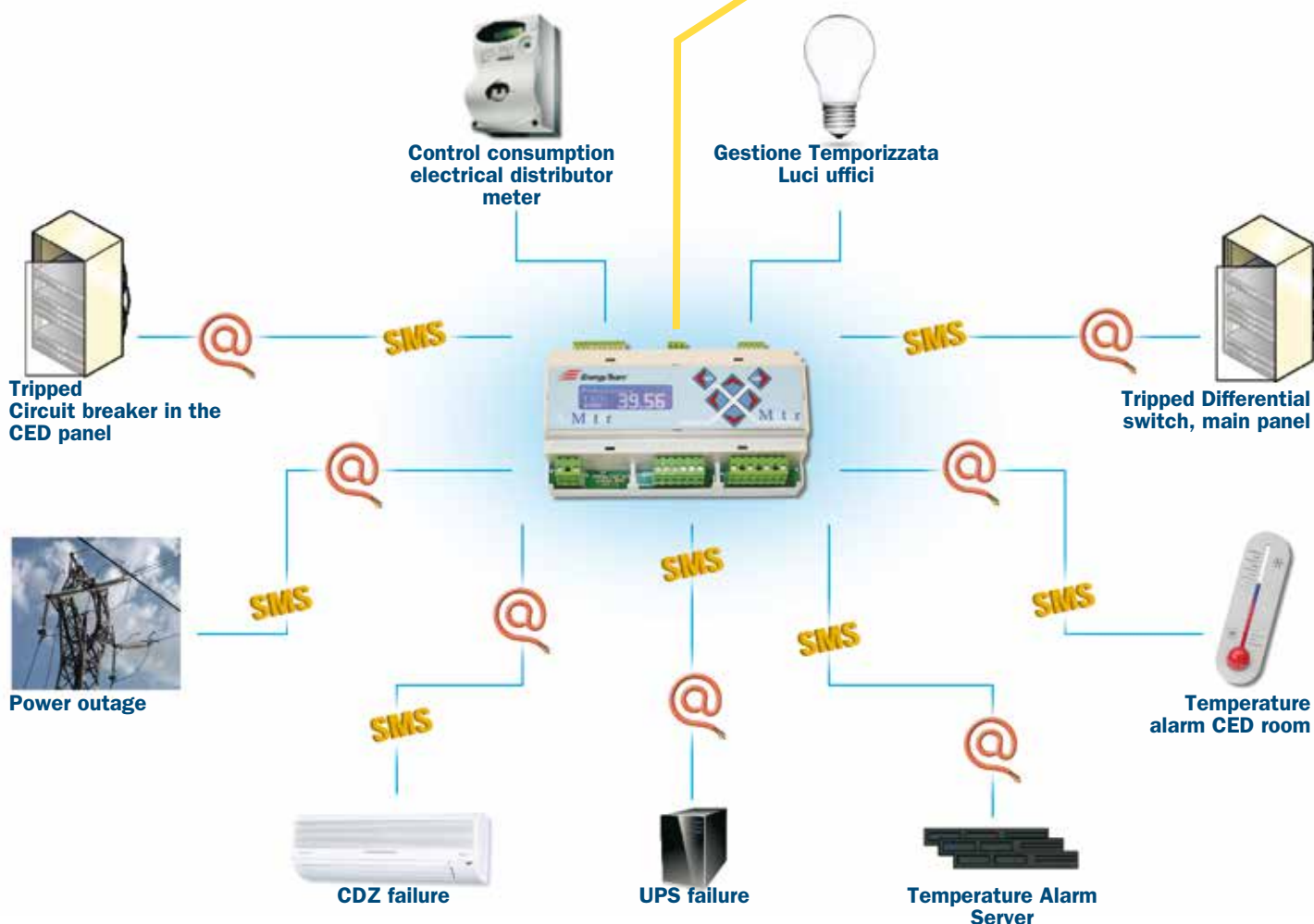
Some of the main causes are:
> UPS failure
> Increase of temperature beyond the limits allowed by the equipment in the room
> Power failure beyond the autonomy limit of the UPS
> CED room air conditioning system failure
> Differential switch on the main panel tripped due to lightning or network disturbances
> Circuit breaker switch on the main panel tripped due to overloads or short circuits
> Server temperature alarm.

Preventing them is impossible, but being able to intervene promptly would allow you to quickly restore the correct conditions of operation and to eliminate or limit certain damages.
The X-Meter device, with 8 inputs, controls PT100 probes and temperature and humidity sensors. With a GSM modem enabled, it allows you to send SMS messages and emails for the various alarm situations.

The X-Meter has all these features and also gives you:

> One measurement instrument with 50 measurements performed
> Monitoring function for general electrical meters
> Electrical mains analyzer
> Supply quality: micro-interruptions and harmonics (opt.)
> Management of diagnostics and alarms, even on electrical measurements
> Logging of the temperatures and humidity in the CED room
> Timed management of office lighting (opt.)
> Logging of energy consumption data (for more information see the product information sheet)
> Increase in value of the cost of energy consumed
> Telemetering of the consumption data online (opt.)
> Possibility of connection to the corporate network (opt.)

Control consumption electrical distributor meter

Gestione Temporizzata Luci uffici

Tripped Circuit breaker in the CED panel

Tripped Differential switch, main panel

Power outage

Temperature alarm CED room

CDZ failure

UPS failure

Temperature Alarm Server

Load management

By combining the XM18 function and the additional XM15 hardware to an X-Meter or XR-WU-Gold, you can create complex load release logic in order to prevent exceeding the power contracted with the energy supplier.

This is possible by using a sophisticated algorithm to progressively control the opening or closing of a predefined list of loads based on a manageable priority list. From the technical point of view, the X-Meter or XRWU-Gold device must, above all, be able to measure the general power at the point of delivery. This is possible in two ways: by reading the impulses produced by a meter (fiscal or non-fiscal) or by measuring the power directly at the delivery point downstream from the voltmeter transducers - TV- and ammeter transducers -TA- (possible only on X-Meter). Setting thresholds and priorities then allows you to individually activate one of the four outputs on the instrument which drive the XM15 module. This module contains 4 relays with two change-over contacts each of which are used to stop or re-insert the 4 connected loads.

When there are more than four loads, you can use additional cascaded tools which, like the first, measure the power at the point of delivery and which are from time to time enabled to release when loads interrupted by the previous device are not sufficient to prevent overproduction. The integration period is selectable between 1 and 60 minutes (the default is 15) and load management will always be carried out based on the average regarding the chosen integration period. The average may be "fixed" or "mobile" based on the fact that sometimes the meter does not make the band synchronization signal available.
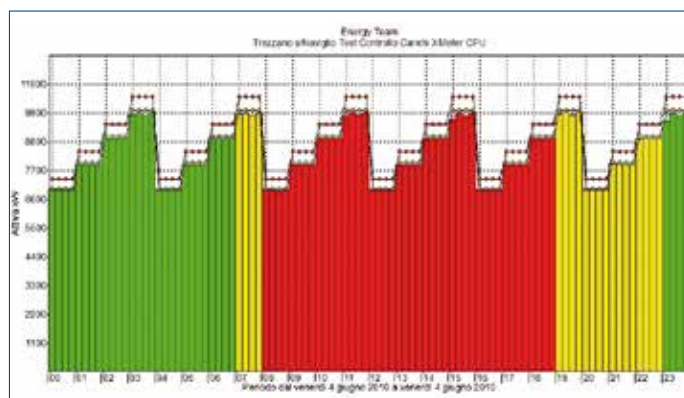
Detailed parameters such as the following can be configured: Work period, Cicyle Time, Initial insensitivity, Safety margin, Default power/tariff, Release/Return power, Minimum operating time, Minimum rest time, Priorities, Work, Force ON, Force OFF. This detailed parametrization allows you to configure every situation and comes to meet all possible needs. A special Excel application lets you prepare, save and send profiles regarding the device.

Excel profile configurator

Load management is done using the forecasting method. The release is commanded when the forecast of total consumption during the integration period, obtained by projecting the current absorption curve to the end of the period, trends beyond the programmed limit. The special algorithm allows maximum use of the available energy within the integration period, penalizing the minimum loads enabled on tripping. The release of the load is commanded as late as possible, taking into account the quantity of energy that can be recovered through it being powered off, based on the weight of the load itself.

This method of control allows you to avoid nuisance tripping and returns that would occur without considering the hysteresis of the individual loads. To avoid dangerous absorption points, caused by the simultaneous restarting of multiple loads, the system provides for a gradual reintegration of loads. The system also allows you to control the loads that in order to be dropped or restarted, require a certain system condition. For these loads, you can inhibit the intervention fo the device if the digital inputs associated with them do not allow it (fundamental for managing utilities whose operation is linked to certain work phases).

Programming window.

Power trend graph with load management.

Programmable clocks

By combining the XM7 function and the optional XM15 hardware with a X-Meter or X-RWU Gold, the programmable clocks extension is activated. This function allows to switch on and switch off each of the four local outputs according to fully customizable weekly criteria in order to solve all the possible requests in the various application sectors (commerce, industry, services, etc.)

It is possible to specify 12 profiles with 8 daily operations differentiated among weekdays, holidays and special days of the week. In addition to these repetitive periods, you can define up to 2 special periods (to be defined with a start and end date), and 20 special days during which the user can apply a profile of his choice for each load. Special periods and days are applied only for the year in which they are defined, while weekly rules can be managed perpetually. During special periods it is also possible to define two particular modes: always-on and always-off.

In this case, besides the manual inserting of data, (as shown on the picture) an Excel application is also available. This application allows the user to intuitively set various profiles for sending the configuration to X-Meter device.

Excel profile configurator.

Programming window.

ES₃ EVO Management and Control Software

The possibility to rationally integrate the potential of measuring devices combined with the processing and management of data collected in the field, is a great opportunity for the Customer who seeks to increase energy efficiency. In fact, only the accurate measurement and analysis of consumption can lead to suitable planning and profitable implementation of production site efficiency policies.

Each generic operation based only on billing information is almost ineffective based on the fact that invoices at most contain the overall cost, the type of energy consumption and the maximum peak. This information is not enough to evaluate the most complex background of the effective absorption of system that can also be very fragmented and distributed over time (in one month there are 2976 integration periods).

ES₃ allows you to monitor and control more than 3000 peripherals divided into groups, sub-groups and sites in order to identify when and where the most energy consumption occurs. Through an operation interface made up of a simple X-Meter device, you can acquire the consumption of all monitored loads accurately and in detail. With the data transfer functions, the archived data are sent to the remote management terminal, which can process them using the ES₃ software and is able to not only ensure the online control of the consumption but also to apply to the individual archived values the same fee calculation logic used by the energy supplier.

From the acquisition of the fiscal meter consumption curve to the supervision of the individual internal lines, with the ES₃ you can make accurate energy consumption measurements and collect analytical information concerning other important electrical parameters that is useful for the efficient management of the whole plant, such as voltages, currents, power, energy, harmonics, network points as well as the integrated monitoring of other utilities such as gas, water and steam. All of this information can be stored and exported for customized processing of the collected data.

In addition, ES₃ software lets you share the consumption totals between different Cost Centres, dividing them in proportion to the real use in the individual consumption "units". With the creation of virtual meters you can than also create some undistributed points that are not countable. ES₃ allows you to check not only the correspondence between what is billed by the supplier and real consumption but also to analyze the effective amount of the consumption of each integration period and to then apply the most appropriate efficiency policies suggested by the audits that were performed. The ability to produce reports and summaries in current file formats (.txt, .csv, etc.) makes it quick and easy to consult and manage the acquired data.

ES₃, the specialized software for energy efficiency used by thousands of Italian companies, effectively identifies leakage, reducing costs and minimizing payback time for your technological investments.
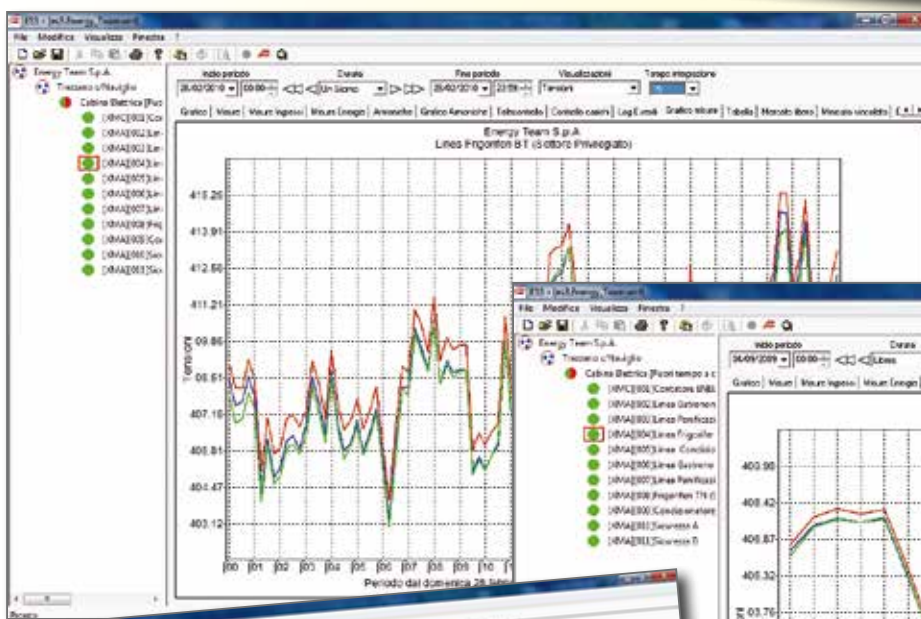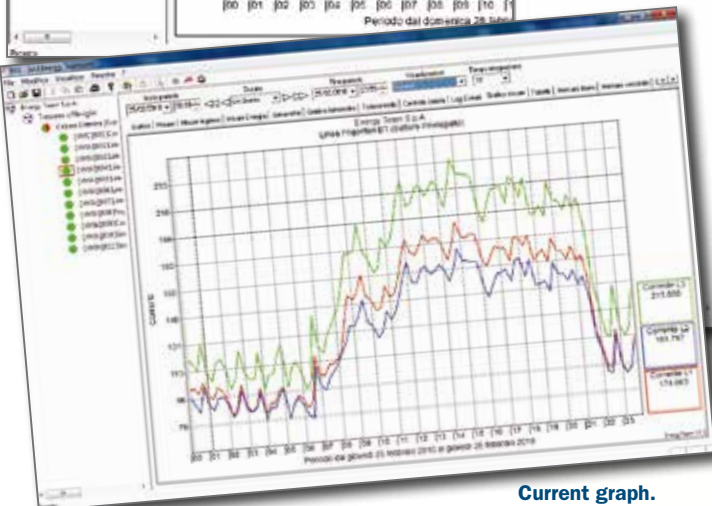

Daily active power.

Graphic comparison.
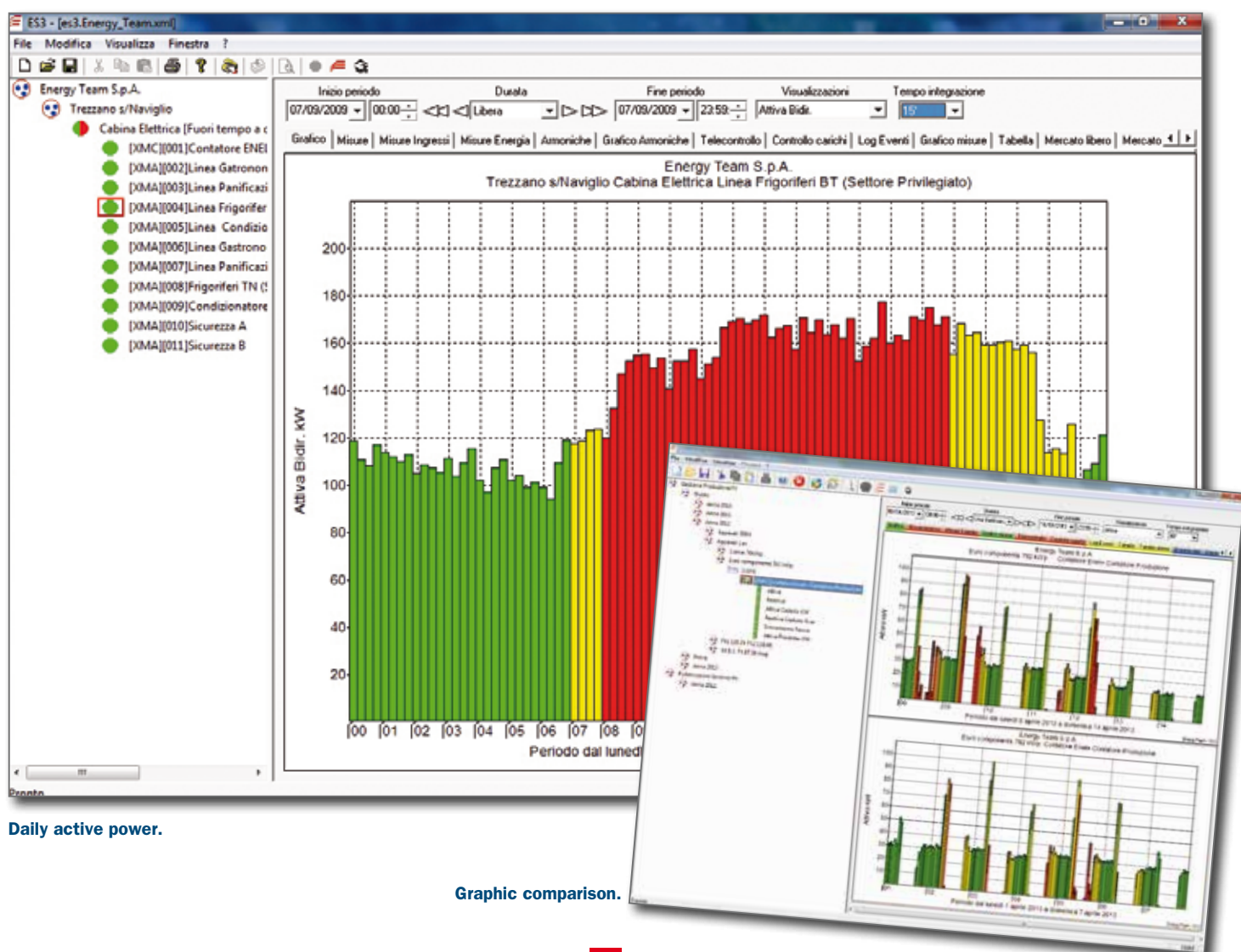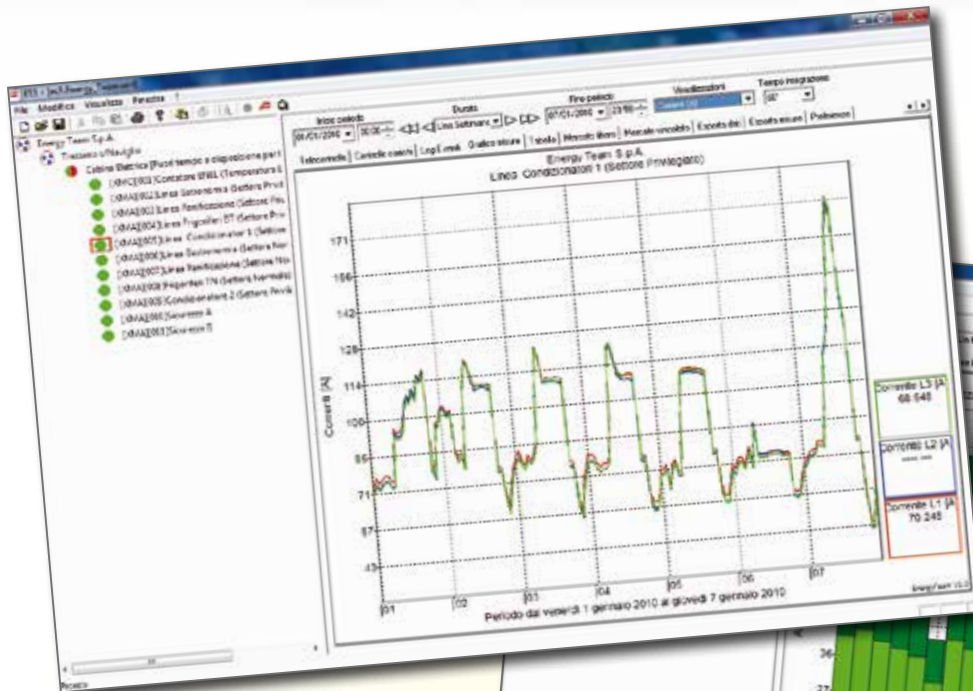
Current graph.

Active power 1 month.

Voltage graphs.

Current graph.

Management and Control Software
Energy Sentinel Web

**Your Energy Data, when and where you want it.
On line everywhere in simple way.**

Energy Sentinel WEB is an application Server that allows remote access to the acquired data, analyzing it through simple and intuitive web pages. The use of the web application on a server makes it possible to ensure the best security regarding the availability and reliability fo the system, allowing plant control through the highest performance of energy efficiency (KPI).

Paraphrasing and playing on a famous American slogan from the Second World War, our system calls us to require the best energy efficiency imposed on us by this new millennium, pointing the way as if to exclaim, "I WATT YOU".

The software, created to be multi-user and multi-site, allows the following functions:
> Display data on the web, using standard http protocol through any browsers (IE, Chrome, Safari, Firefox) with Flash plug-in. Ability to encrypt the connection with https protocol
> Check the stored data, accessing it an any time from any web location, with a user id and password, without installing any additional programs.
> Entirely configure data access on the web, setting access to the various areas for each user. (you can decide who can access the data and what data they can see)
> Management of the data coming from several devices, even if they are geographically far apart.
> The versatility fo the platform allows the integration of third party devices and instruments through the implementation of their system protocol.
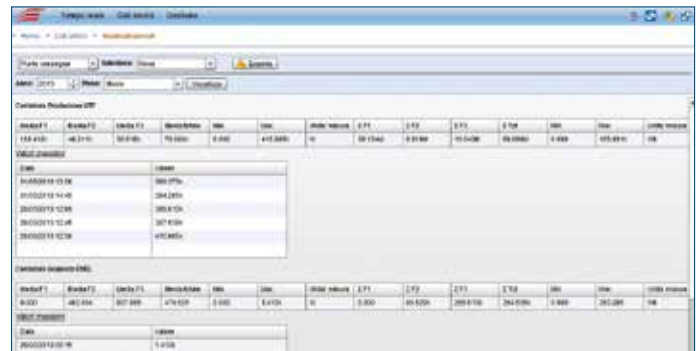> The consultation interface is optimized for Ipad and tablet.

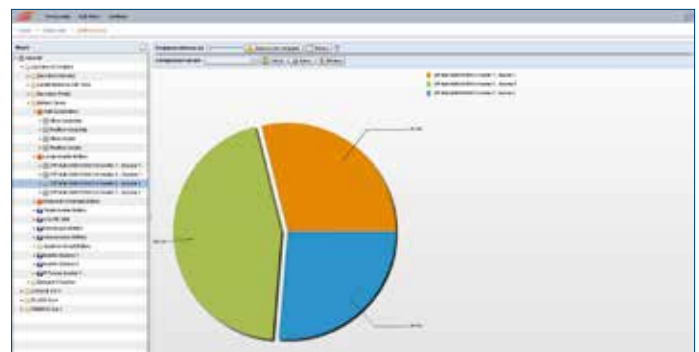**Start menu for Energy Sentinel Web programs**

Graphic display with stack diagram for different buildings

General energy consumption on Energy Sentinel Web

Period summary on Energy Sentinel Web

Synoptic system graph on Energy Sentinel Web

Through its simple and intuitive graphic interface it is possible to:
> Create and compare graphs, histograms and diagrams
> Compare data with very different full-scale
> Create mathematical modules to create virtual channels
> Display fully configurable real time data
> Display fully configurable graphs
> Display period summaries
> Share consumption in bands
> Specify which fields to view as values, linear graphs, in lines or columns
> Display historical data on a freely selectable time period as a line or column graph with two vertical axes
> Arrange data in tables
> Export data in CVS format for Excel.
> Create and set groups and subgroups for data coming from the various monitored systems (unlimited number of levels)
> Set alarm thresholds, sending SMS and email messages if threshold values are exceeded.
> Set and display the tariff
> Support for filling out UTF form.
> Alarms on closing and opening contacts or thresholds with hysteresis

Management and Control Software

Photovoltaic system management software

Energy Sentinel PV allows you to constantly monitor all of the essential information for managing the production level of a photovoltaic system. The system includes an application server installed on an industrial concentrator (fanless, operating temperature -20° +75° C) based on Linux architecture able to acquire data from various devices (string control, solarimeters, pyranometers, inverters, fiscal meters, weather stations) distributed inside the photovoltaic system. Once this information has been collected, stored and analyzed according to standard or customizable models, it is possible to identify:
> inverter efficiency
> mismatching and string efficiency
> photovoltaic system efficiency
> photovoltaic system performance
> inverter anomalies
> parallel panel anomalies (with CM2)
> discharger failure.

Besides consultation via the web interface, this information can be used in order to generate early warnings through sms and email. The standard alarms are:
> string current control
> field panel temperature
> inverter connection control compared to irradiation
> inverter failure status control
> opening/closing contacts
> thresholds exceeded
> device communication failure.

The web display is divided into two main areas: real time data and historical data. Real time data can be consulted on the easily configurable pages (that is, you can create configurations specifying the fields to be viewed) as values or a pie chart. The historic data can be displayed on a freely selectable period in a bar or column graph with two vertical axes that allow comparison among data with very different full scale outputs. The data displayed can be arranged in a table or can be exported in CVS format for Excel. The consultation interface is also optimized for Ipad or tablet.
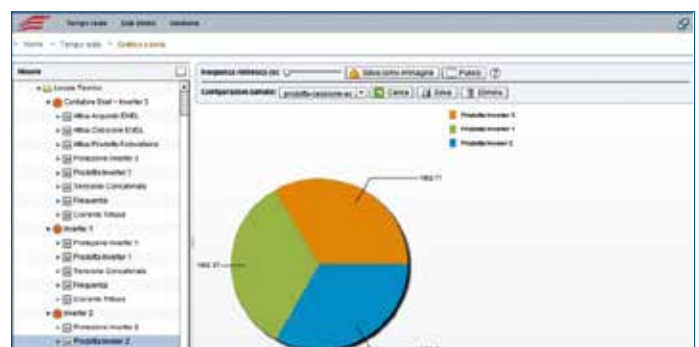

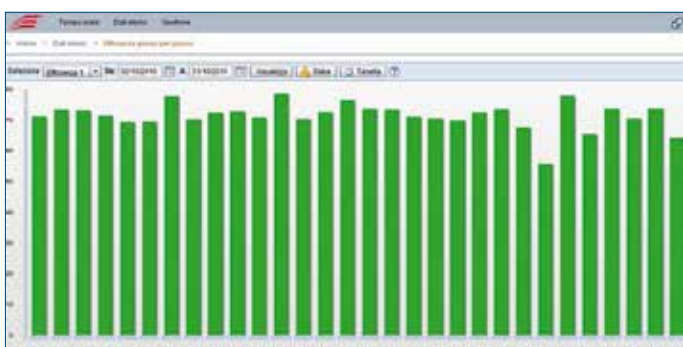**Energy acquired, produced and consumed on Energy Sentinel PV.**

Synoptic system graph on Energy Sentinel PV.
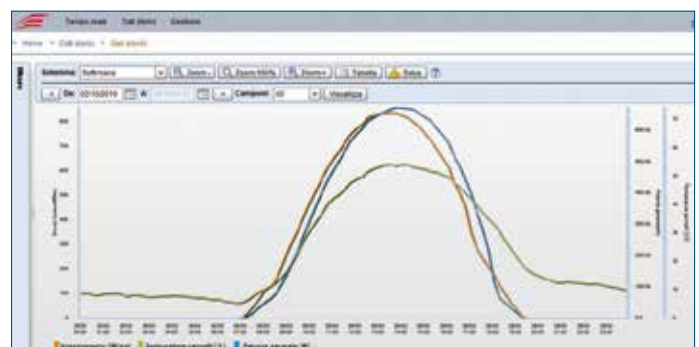

Start menu for Energy Sentinel PV.

Pie graph produced on Energy Sentinel PV.

Efficiency graph of the system on Energy Sentinel PV.

Real time system display on Energy Sentinel PV.

Photovoltaics

The constant request for technical and management information needed by photovoltaic system managers has led Energy Team to create a valid efficiency monitoring system for the entire system. It is also possible to use it to obtain information on the functionality of the system by sending SMS and email when certain configurable alarm situations occur.

The X-metersun24h monitoring system, which its high degree of modularity and expandability can be adapted to both a small system (3-6 kw - lv supply) and a large system (>250 kw - mv supply).
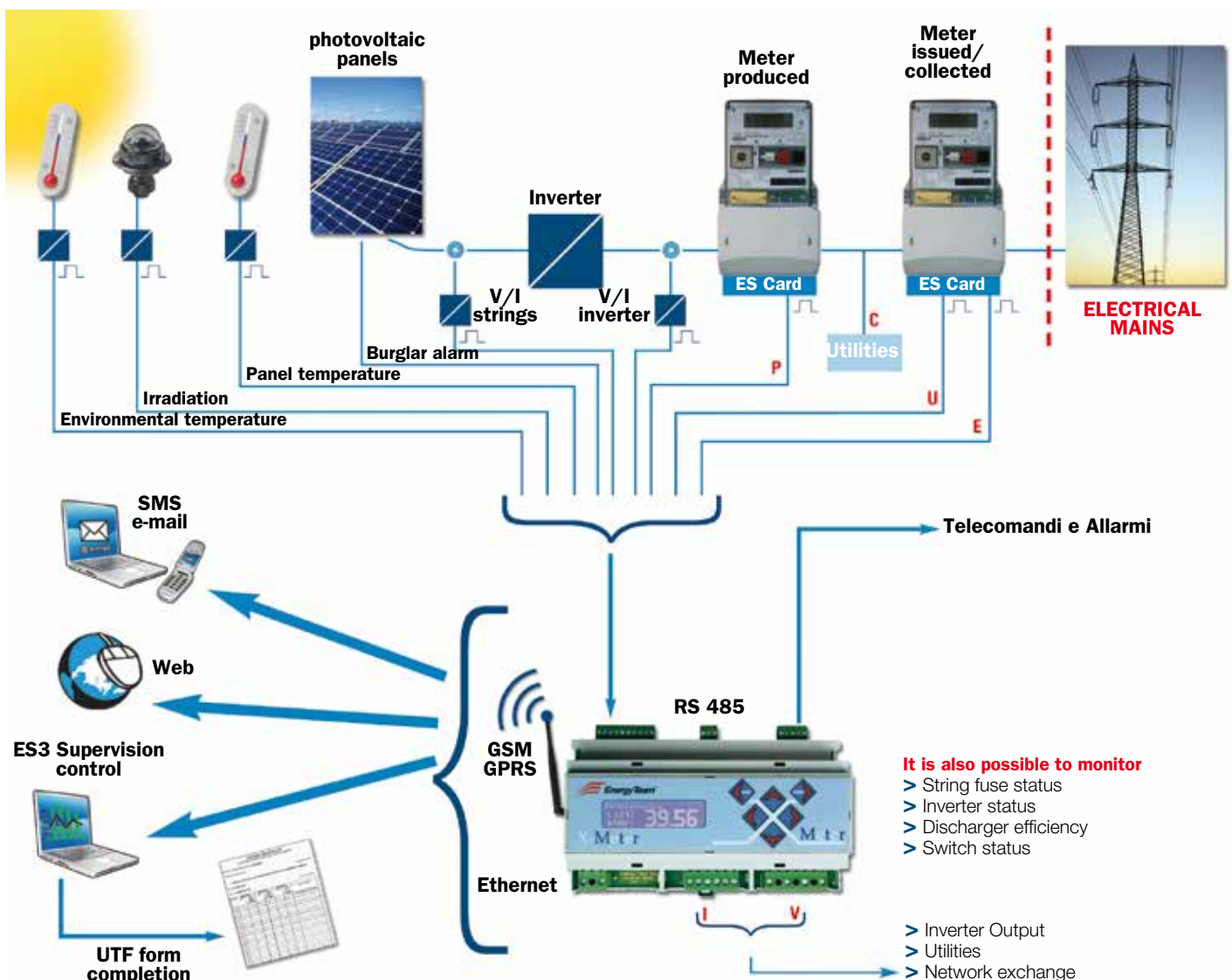
In summary, with the system it is possible to:
> measure and acquire the DC power output from the panels with accuracy greater than ±2%
> measure and acquire the AC power output from the inverter with-accuracy greater than ±2%
> acquire and sample solar irradiation (W/m2) from a solarimeter
> acquire the average temperature of the photovoltaic panels
> acquire and display all of the electric factors in AC in class 1
> measure both the energy produced by the system (encouraged throughthe Energy Account) and that exchanged with the electrical networkin order to determine costs (network fees, transport, excise duties, etc.)
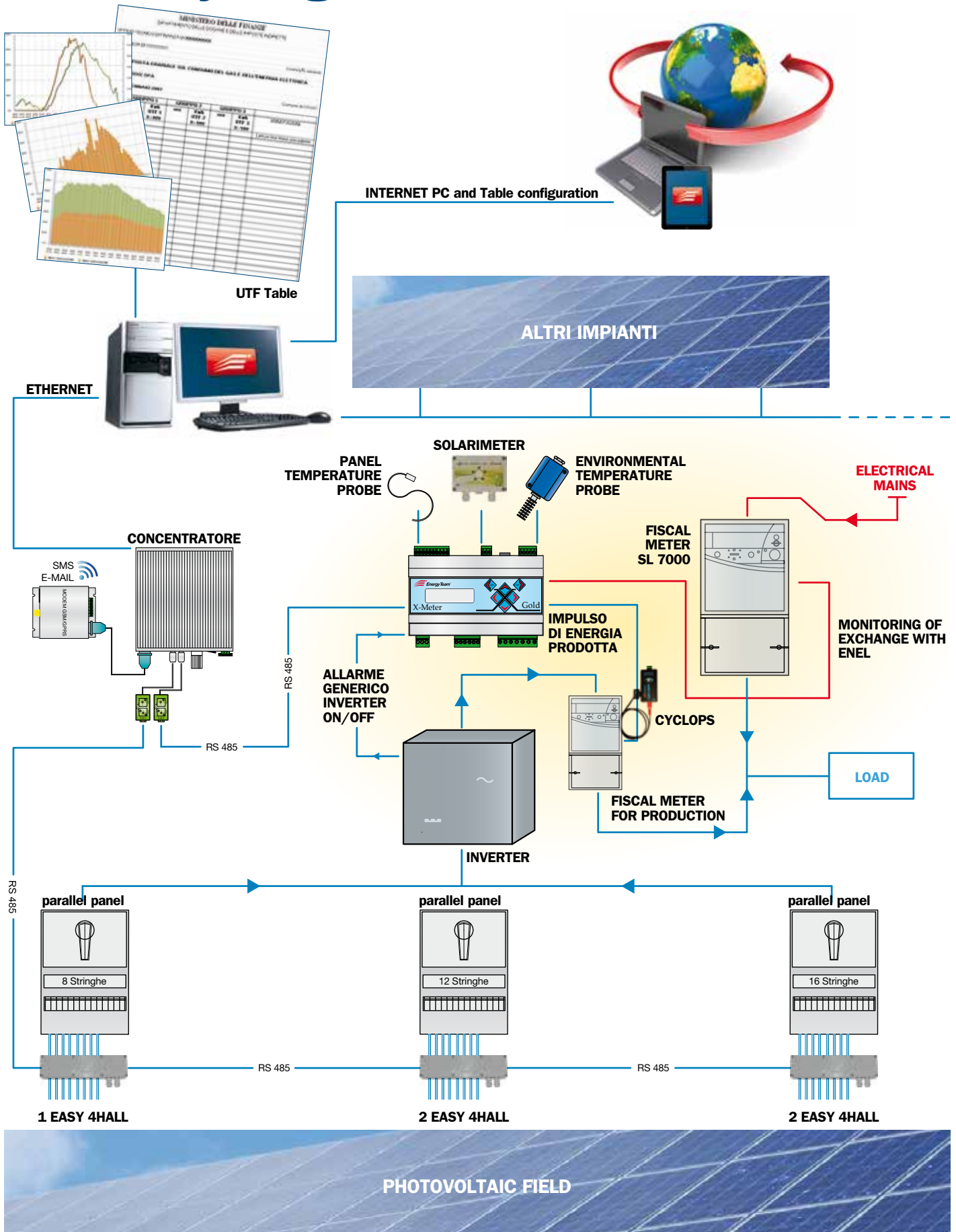
Send notification of failures via SMS and email:

> switch status MV, LV, circuit breakers, etc.
> inverter status/failure
> environmental temperature, panel temperature, field panel temperatureburglar alarm
> other configurable threshold or status parameters.

In relation to these factors and signals, the X-MeterSun24h makes it possible to:
> measure and store the energy upstream and downstream from the inverter, with the inverter performance
> estimate panel efficiency based on the temperature and solar irradiation
> measure and store the energy produced by the system
> measure and store the energy issued on the network
> calculate and store the energy acquired
> signal failures and/or alarms via SMS/email
> be able to connect to the device (Ethernet/GSM-GPRS) and check parameters
> be able to connect several devices in their own network (Ethernet/RS485)
> automatically fill out the UTF form
> publish the data available online.

Assembly diagram

INTERNET PC and Table configuration

UTF Table

ETHERNET

ALTRI IMPIANTI

SMS
E-MAIL

CONCENTRATORE

MODEM GSM/GPRS

RS 485

RS 485

PANEL
TEMPERATURE
PROBE

SOLARIMETER

ENVIRONMENTAL
TEMPERATURE
PROBE

ELECTRICAL
MAINS

FISCAL
METER
SL 7000

EnergyTeam
X-Meter   Gold

IMPULSO
DI ENERGIA
PRODOTTA

MONITORING OF
EXCHANGE WITH
ENEL

ALLARME
GENERICO
INVERTER
ON/OFF

CYCLOPS

LOAD

FISCAL METER
FOR PRODUCTION

INVERTER

RS 485

parallel panel

parallel panel

parallel panel

8 Stringhe

12 Stringhe

16 Stringhe

RS 485

RS 485

1 EASY 4HALL

2 EASY 4HALL

2 EASY 4HALL

PHOTOVOLTAIC FIELD

Easy 4 Hall
Openable outdoor multichannel device for string current measurement in photovoltaic systems.

All of the solutions currently on the market are open modules or devices with a low degree of humidity protection, designed to be inserted inside closed and waterproof electrical boards. They occupy considerable space, which inhibits their installation in pre-existing electrical boards. With the current devices, it is almost impossible to monitor an existing system without replacing the parallel electrical panels for existing strings. In most cases, the increased volume of the new panels makes installation impossible.

> Inconsistent plant impact
> Exempt from recertification of the existing parallel boards
> Easy to install
> Small size
> The plant does not need to be shut down for installation
> A precise and accurate data reading is possible without stopping or disconnecting any string or tightening terminals.
> Up to 8 strings can be monitored per module.
> Integrated Modbus communication module.
> The lack of terminals and physical connections on the strings eliminates all preventive maintenance
> Can be used outdoors without the need for other waterproof cases.
> No electrical contacts with existing circuits, maximum electrical safety and low electromagnetic susceptibility
> The simplest and most economic solution on the market.
> Patent request registered

The device is made up of two rectangular half-shells. The first half-shell (bottom) has comb-shaped grooves to insert and hold the cables carrying the currents to be measured. In addition, this shell holds half of the magnetic circuits of the sensors, made up of ferrite elements supported and guided so they are coupled with precision to the remaining part of the magnetic circuits located in the second half-shell. This second shell is divided into two compartments: the first contains some magnetic elements having a thin air-gap and inside is a magnetic field sensor for measuring the flux induced by the conductor to be measured and directed from the magnetic circuit. In order to get the requested degree of impermeability, the magnetic and electronic circuits in the first compartment of the shell are embedded in epoxy resin while the accessible side for sensor connection and data output is protected by trim and an appropriate mechanical design of the case.

> Measures up to 8 string currents without the need to interrupt the connection.
> Current reading using Hall effect sensors and 14 bit analogue/digital converter.
> Internal temperature measurement in Celsius (from -30°C to +80°C, accuracy 1°C).
> 16 bit microcontroller technology

> Power supply 12/24Vdc, 500mA max.
> The data concerning the temperature and current are sent
> through the RTU Modbus on insulated RS485 serial port (with the possibility of internal jumper termination).
> Ability to select the readings to be performed and the Modbus protocol parameters (baud rate, parity, address, stop bit).
> >Enter "Config Mode" laying a magnet (included) for 5 seconds on the container, with audible signalling; selection of Modbus parameters, writing to special registries.
> Custom printed plastic container, the double cable gland PG9, passivation with insulating resin and O-ring on the lock give the device its IP65 rating.
> Current reading range: +/-16 A.
> Minimum accuracy: 100mA.
> Outer dimensions (without cable gland): 244x64x37mm.

Technical data

General	
Dimensions	6244x64x37 mm (with cable gland) (244x84x37mm)
Weight	About 150g
Case material	Grey polycarbonate
Protection rating	IP65
Power supply	12-24Vdc, 500mA max (5W)
Operating temperature	From -20°C to +75°C
Cable to use	BELDEN 9841 (1 pair + shield, multi conductor, low capacity)
ModBus Connection	Through 2 terminals (double connection)

Features and Performance	
Current measurement	8 direct currents +/- 16A, Hall effect technology
Internal Temperature	From -30°C to *80°C, accuracy 1°C
Communications	Slave RTU Modbus on galvanically insulated RS485
Configurable parameters	Baud rate (1200-2400-4800- 9600-14400-19200-28800-38400-57600-115200), parity (None, Even, Odd), stop bit (1 or 2), address (1-247)
Select operating mode	Through magnetic key and Modbus registries
Signal operating mode	Through audible signal (buzzer)
Installation characteristics	Optional wall-mounting brackets

CM2 Solar PV String Controller

The CM2 SOLAR PV String Controller module continually monitors the production level of the electrical energy produced by the photovoltaic panels, and detects any inefficiency, in order to intervene promptly if losses occur due to faults in the production system. Despite its small size, the device (only 9 DIN modules) has the following functions:

> Measures 8 string currents up to 10 A with voltage up to 1000 VDC
> Measures temperature (-30°C *75°C)
> Detects 3 logic statuses through 3 optically isolated inputs(e.g., discharger status, switch status, etc.)
> Acquires 2 environmental parameters at impulse level(solarimeter, panel temperature, environmental temperature)
> Pilots 1 load through an open collector output
> Makes a feed-through connection with cable sections up to 4 mm^2
> Measures string voltage through a dedicated external module input(XM20, optional)
> Communicates via Modbus-RTU on 3 wire RS-485
> Creates a device network through the RS-485 connection.

The standard Modbus-RTU makes the following information continuously available:

> Instantaneous value of the 8 string currents
> Average of the 8 string currents for the last interval between 2 requests
> Maximum value of the 8 string currents for the last interval between 2 requests
> Status of the 3 digital inputs
> 2 digital environmental parameter inputs
> Implementation of an output
> Instantaneous, average and maximum value of the string voltage (option through XM20)
> Measures temperature (-30°C +75°C)

The device allows the transformation of a normal parallel string panel into a true latest generation String Box, limiting the bulkiness fo the cabling and the cost. This makes CM2 SOLAR PV String Controller the most versatile solution on the market. The information transmitted to a CM3 Log are made available (online or locally) by the SMT-Solar software which can display it online, process it, present it graphically and log it so it can be used to determine actual system efficiency and establish the actual production level compared with the forecast project level.

Dimensions

90 mm

58 mm

157, 5 mm (9 modules DIN 46277)*

Technical data

Power supply	12 Vdc
Number of strings	8 Strings
Max current for each string	up to 10 A
String input voltage	0 ... 1000 Vdc
Measurement field Circuit temperature	Da -30 °C a +75 °C
String input voltage	1 external hardware input
Optically isolated inputs	3 passive non polarized inputs, 12 Vdc
Environmental parameter inputs	2 passive inputs, 12 Vdc
Outputs	1 open collector output from 100 mA - 50V
Communication	RS-485 with MODBUS-RTU
Node address	1-99 selected via dipswitch
Visual indicators	LED Power and communication indicator
Max section of string cable	4 mm^2
Max cable section from terminals 1 to 18	up to 0.75 mm^2
Connection type	Single screw terminals for string input and output
Footprint	9 DIN module plastic container (157 mm)
Environmental protection	IP20
Consumption	3 W
Weight	500 gr
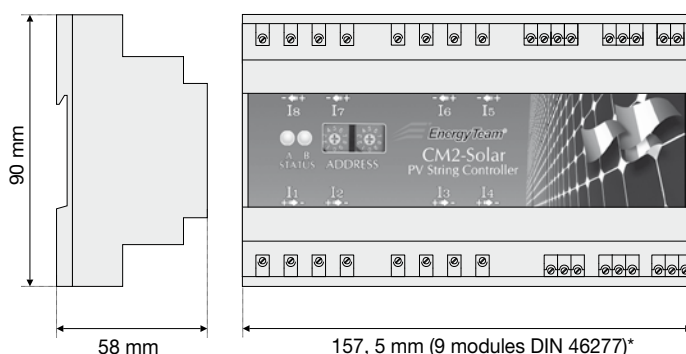
Ingressi/Uscite
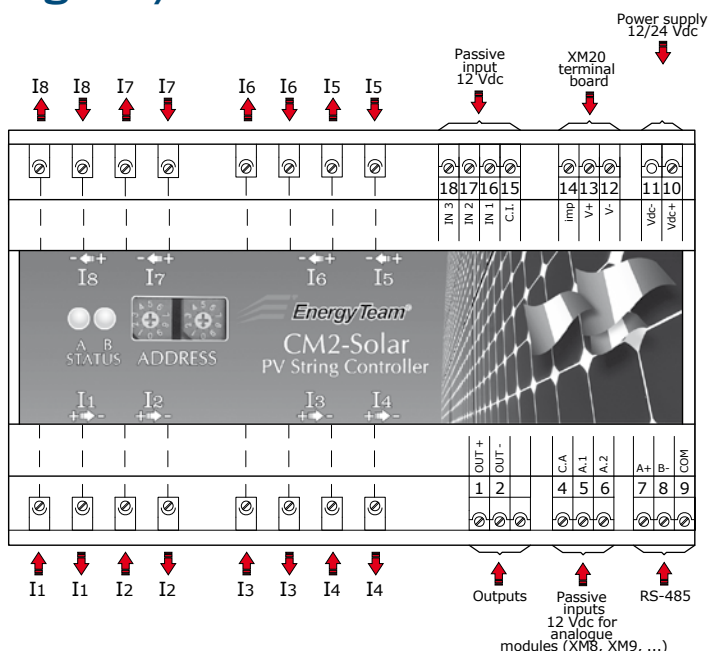
XM 20
Photovoltaic plant continuous voltage reading module

The XM20 device allows the reading of an analogue direct voltage signal up to 1000VDC and its translation into a 0-5 Hz pulsed signal compatible with the standard input signals for **CM2 Solar or XRWU GOLD/X-Meter.**

Guaranteed precision of 0.5% of full scale

The special characteristic of this device, besides its extremely small size with a single DIN module, is the presence of an internal galvanic insulation equal to 4 kV between the measuring field circuit and the pulsed output circuit.

Technical data

Power supply	8 … 24 Vdc
Consumption	0.85 W, 71 mA
Precision	0.5 % of full scale
Visual indicators	over range and pulsed output
T° Operating range	-20 … +70 °C
Output field galvanic insulation	4 kVdc
Max connection cable section	1.5 mm^2
Max measured range	0 … +1000 Vdc
Pulsed output range	0 … 5.0 Hz
Weight	60 g
Module width	17.5 mm
Module height	60 mm
Protection rating	IP20
Container type	1 DIN module

Connection notes

M- Terminal to connect to the negative pole of the connection bar.

**M+** Terminal to connect to the positive pole of the connection bar.

Stat

The yellow LED flashes in proportion to the measured value.

Meas

The red LED is steadily lit when the measurement is invalid.

When the yellow and red LEDs are lit, there is an anomaly.

Notes for connection of power supply and outputs

− + Power supply 12 Vcc
Wire to the CM2 Solar \3(+) and 12(-) terminal or to terminal 29(+) 30(-) on the X-Meter

P Pulsed output.
Wire to CM2 Solar (14) input or to one of the inputs (21 - 28) on the X-Meter
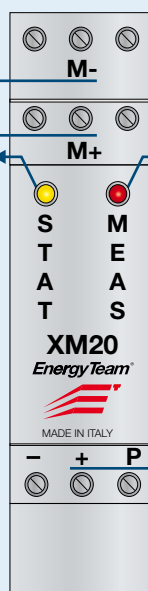
XM 21
Photovoltaic plant direct current reading module

The XM21 device reads a continuous analogical current signal from a string and then converts this value into a pulsed 0-5 Hz signal with the standard for input signals for **CM2 SOLAR or XRWU GOLD/XMETER platforms**.

Guaranteed precision of 0.5% of full scale

The special characteristic of this device, despite its extremely small size with a single DIN module, is also the internal galvanic insulation equivalent to 4kV between the measuring field circuit and the pulsed output circuit.

Technical data

Power supply	8 ... 24 Vdc
Consumption	1.2 W
Precision	0.5 % of full scale
Visual indicators	over range and pulsed output
T° Operating range	-20 ... +70 °C
Output field galvanic insulation	4 kVdc
Max connection cable section	1.5 mm2
Max section of string cables	10 mm2
Max measured range	0 ... +10 Adc
Pulsed output range	0 ... 5.0 Hz
Weight	150 g
Module width	17.5 mm
Module height	60 mm
Protection rating	IP20
Container type	1 DIN module

Connection notes

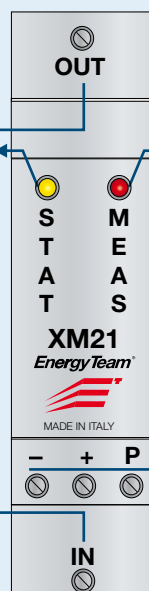**OUT** Terminal for outgoing current (to connection bar).

The yellow LED flashes in proportion to the measured value.

Stat

Meas

The red LED is steadily lit when the measurement is invalid.

When the yellow and red LEDs are lit, there is an anomaly.

IN Terminal for incoming current (from the string).

Notes for connection of power supply and outputs

- + Power supply 12 Vcc. Wire to the CM2 Solar \3(+) and 12(-) terminal or to terminal 29(+) 30(-) on the X-Meter.

P Pulsed output. Wire to one of the X-Meter inputs (21 - 28).
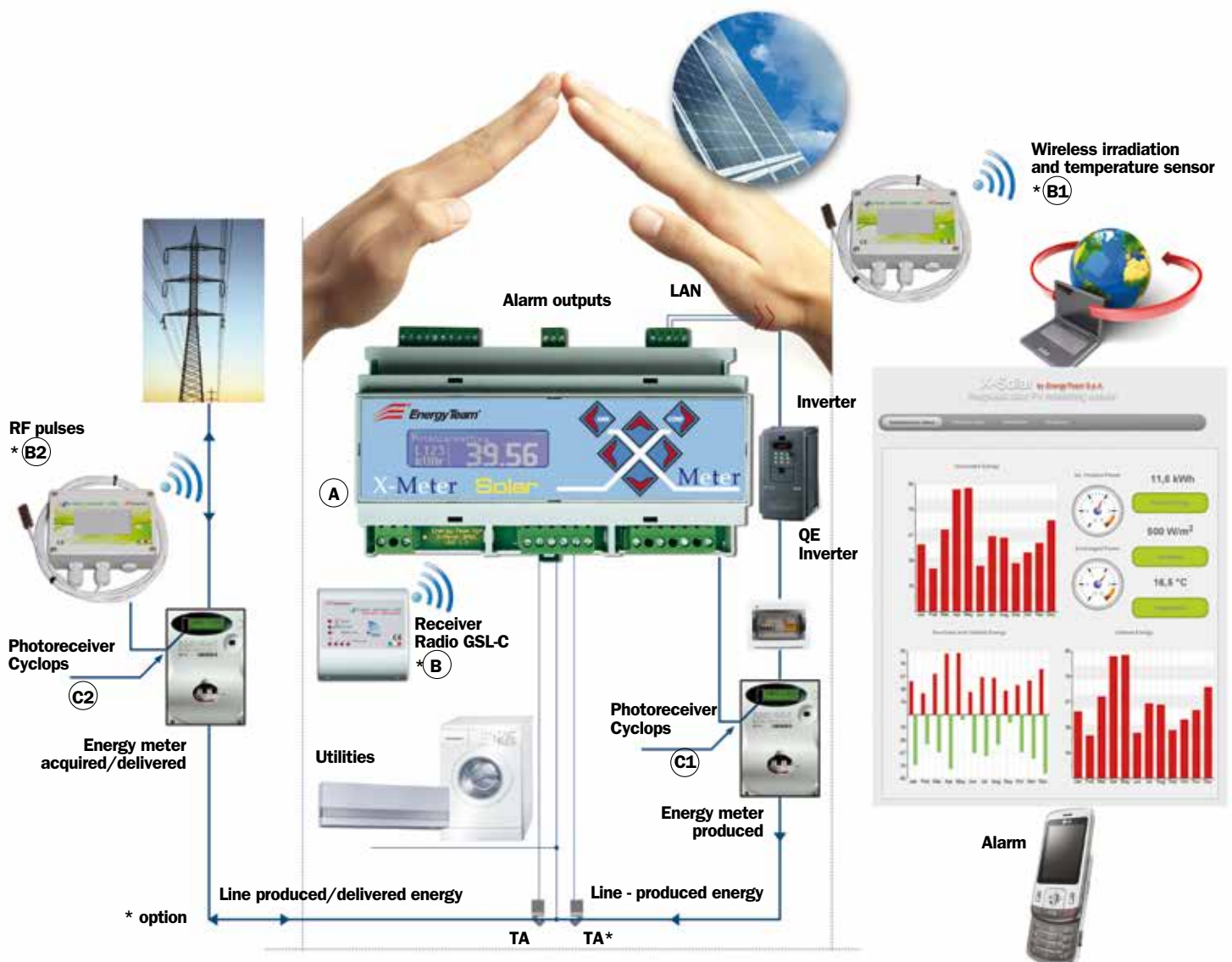
X-Solar

Photovoltaic system monitoring with WEB interface

With the X-Solar system you can acquire and verify the main parameters for a small photovoltaic plant, clearly showing the energy and economic data for easy management and verification of the plant even without specific expertise.

In summary you can:
> Acquire energy and economic data for easy management

> Acquire data and consult it directly on a PC or tablet

> Apply up to two optical interfaces to two already present fiscal meters (Energy Produced and Energy Acquired/Delivered).

> Detect the direction of energy flow for exact accounting

> Insert a combined irradiation sensor and temperature panels in the system, including the option to transmit data via radio.

> Generate alarm status (lack of production with irradiation, inverter anomaly, QE Inverter circuit tripped).

> Have an instrument with an Ethernet interface.

> Have the functionality of the system with a Web interface and a system able to send daily emails with production data

Put yourself in safe hands

Wireless irradiation and temperature sensor *B1

Alarm outputs

LAN

Inverter

RF pulses *B2

QE Inverter

A

X-Meter Solar

Photoreceiver Cyclops

C2

Receiver Radio GSL-C *B

Photoreceiver Cyclops

C1

Energy meter acquired/delivered

Utilities

Energy meter produced

Alarm

Line produced/delivered energy

Line - produced energy

* option

TA   TA*

In order to get maximum control of the plant performance, it is possible to insert a combined panel irradiation and temperature sensor in the system with the option to send the data via radio, which is useful where cable installation is difficult.

Ethernet network operation

The instrument has an Ethernet interface which, when used, allows the system functionality to be expanded with a **web interface** and email system by means of **additional services**.

The web interface makes it possible to consult the data described below using a normal browser (recommended Firefox, Opera, Chrome, Safari) and a PC, tablet or netbook connected to the local network via cable or wi-fi.

Data available online: instantaneous values

> Power generated (production assignment (kW)
> Consumption power (part of the power produced used locally)
> Power delivered to the network (exchange sale) (kw)
> Power absorbed from the network (exchange during absorption) (kW)
> Power used (production + exchange) (kW)
> Irradiation (W/m^2)
> Panel temperature (°C)
> Power expected with current irradiation and temperature (kW)
> Status of network exchange (absorption, delivery, null)
> Inverter production status
  (full production, degraded production or off)

Data available online: historic values

> Daily or monthly data for the last 10 years

Values available:
> Power generated (production assignment (kW)
> Consumption energy (part of the power produced used locally)
> Power delivered to the network (exchange sale) (kw)
> Power absorbed from the network (exchange during absorption) (kW)
> Energy used (production + exchange) (kWh)
> Remuneration for energy produced (€)
> Remuneration for energy delivered to the network (€)
> Cost of energy drawn from the network (calculated on average cost per kWh) (€)
> Cost of energy used (production + exchange) (€)

With the option of combined panel irradiation-temperature sensor:
> Energy expected (kWh)

Graphs related to energy produced, energy delivered, energy acquired, energy consumed:
> Graph showing the daily production on an hourly basis throughout the day for previous and current day
> Graph showing the monthly production on a daily basis for the last 10 years

Stand-alone operation

In this mode the instrument is not connected to the Ethernet network. The data acquired can be viewed on the display on the X-Solar instrument.

Alarms

When the system is coupled to the combined irradiation and temperature sensor it can generate the alarm status corresponding to low plant performance (due for example to shadows from trees that have grown since the plant was installed or dirt on the panels) or lack of production when there is solar irradiation (due for example by an inverter failure or blown circuit breaker). The first type of alarm is based on data from the previous day while the second is based on real time with a one hour delayed signal to prevent false alarms due to temporary cloudiness. The alarm is shown on the instrument display and the two special contacts (digital outputs).

Web page example

Basic configuration for monitoring the produced energy meter >X-Meter Solar Web server
> Cyclops photoreceiver LED - photoreceiver module for reading the LEDs on the exchange meter.
> Cyclops photoreceiver Wireless LED - for reading the LEDs on the production meter
> Radio solarimenter - solar irradiation meter
> PT100 Temperature sensor - for photovoltaic panel temperature
> GSL-C Wireless Gateway - radio reception module from panel irradiation and temperature sensors
> Operable current transformer - to discriminate the direction of the energy flow.

Additional Services

By adding the additional services, the following are possible
> send alarms via email and a possible daily email with production data
> Backup the daily data in the event of an X-Solar failure eliminating the possibility of losing historical data
> See and consult the web page even outside of the customer's local network
> Consult data from several plants
  (for installers and maintenance technicians).

Parallel panel with Integrated String Control systems

SBC8 - SBC12 - SBC16 - SBC24 Strings

Parallel String panels built in full compliance with CEI EN60439-1+A1. Combining the String Controller CM2 with this device achieves maximum integration between the parallel panel and the String Box Control.

The full compliance with the standards, attention to detail and materials used, attention to tests and the use of Hall effect technology combined with the research completed make the Parallel Panel family with integrated String Control system SBC8 - SBC12 - SBC16 - SBC24 Strings, an ideal product to face the challenge of time and reliability required in a photovoltaic system infrastructure that must be maintained for its entire duration.

The parallel string panels with CM2 remote control for photovoltaic systems are built inside an IP65 fibreglass container with blind door. They are ready for wall-mounting and are grey 7035. It is available for 8, 12, 16 and 24 string systems. The main feature is the extremely small size.

They include
> Switch disconnectors for minimum voltage coil and auxiliary status contact
> Surge protection from indirect lightning strikes with remotesignalling and removable module
> Protective fuse and related disconnecting switches
> Common step bars
> Multi-polar distributor

They combine with
CM2 remote control modules with the following features:
> Power supply 12-24 Vdc
> Measurement of 8 strings
> Up to 12 A per string
> Measures temperature (-30°C +80°C)
> 3 inputs (1 for remote signalling discharger + 1 for switch + 1 available)
> 1 open collector output
> 2 environmental parameter inputs
> 1 XM20 module input
> RS485 interface
> Dimensions 9 DIN mod.

XM20 modules for measuring string voltage:
> Power supply 8-15Vdc
> Voltage measurement up to 1000 VDC
> Precision 0.5% f.s.
> Pulsed output 0.5 Hz
> Dimensions 1 DIN mod.

Power supplies 12VDC 1.25A

Cyclops photoreceiver
## A precise watchful eye on Electrical production and/or consumption

This device is able to detect the amount of the Energy produced, consumed and counted from any meter equipped with an optical output (Red and yellow LED). The Photoreceiver converts light signals from active energy, emitted by the LED on the meter, into pulses. Once these pulses have been acquired by the datalogger (X-RWU), the energy consumption of a plant can be monitored.

When Cyclops is coupled with a X-Meter and a XM3, TA or Rogowsky and Voltmetric probes, it also can read and record pulses coming from bidirectional meters. **The accuracy of the measurement is guaranteed** by the fact that the device interfaces with the meters and acquires the measurement directly **from the LED used as metrological reference for calibrating the meter**.

The installation of the device is simple, quick and non-invasive. Apply a small probe to the meter that is equipped with a photoreceiver and can be connected to the Cyclops module by means of a connector. It then sends the pulses to an X-RWU or an X-Meter equipped with XM3. Cyclops is recommended in the photovoltaic field for reading the LED on the UTF meter remotely read by GSE.

How to install Cyclops
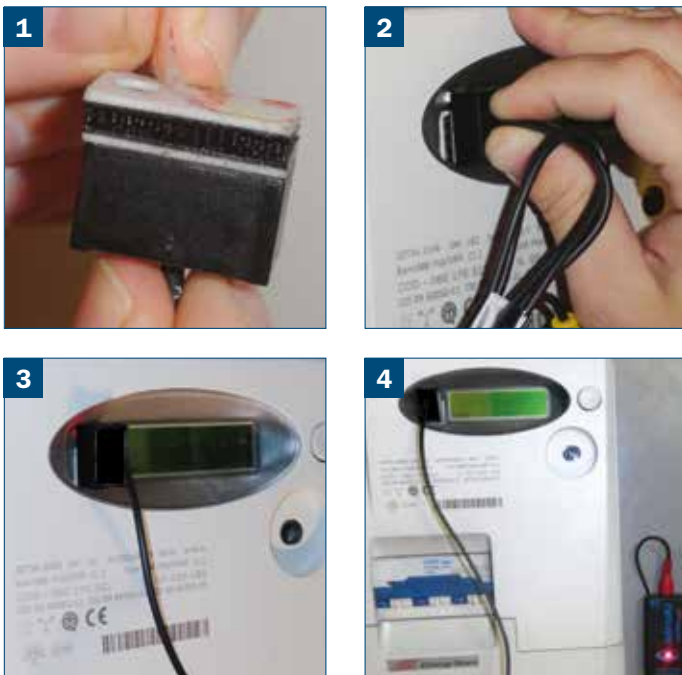
Technical data

General	
Dimensions	39 x 78 x 23 mm (module) 22 x 14 x 12 mm (photoreceiver)
Weight	30 g.
Case material	Plastic
Protection rating	IP20
Operating temperature	-20° ÷ +70°C
Relative humidity	95% non-condensing
Other features	External probe with photodiode Cable L = 50 cm
Electrical	
Power supply	+12 ÷ +24 Vdc
Consumption	33 mW / 2,8 mA,
Visual indicators	1 LED, flashes with pulse received
Output	Open Collector: VMAX = 28 Vdc; IMAX = 100 mA
Output pulse length	Settable to 50 or 100 mSec
Power cable	Sez. 0,25 mm² (AWG 23); LMAX = 500 m
	Sez. 0,50 mm² (AWG 20); LMAX = 500 m

Some examples of meters where the photoreceiver can be installed

ISKA	LANDIS + GYR	ACTARIS SL7000	GET2A	GET3A	GET4S	GIST	GISS

Solarimeter

Sensor for Solar Radiation and Temperature PT100 with pulse Digital outputs, 4÷20 mA Analogical Outputs and Modbus RTUGSL-IT-DA

Technical data

General	
Dimensions	120x80x45 mm
Weight	265 grams
Case material	Polycarbonate for the case, polyamide for the accessories
Protection rating	IP65
Power supply	12 to 24 Vdc, absorption 1W without current loop
Operating temperature	-20°C ÷ +70°C
Relative humidity	90%
Other features	Equipped with anti-condensation device
Irradiation	
Sensor	Photodiode
Measurement range	0-1200 Watt/m^2
Precision	2.5% in sunny conditions with irradiation of 100 W/m^2
Temperature	
Sensors used	2, 3 or 4 wire interface for PT100 (Optional PT100 probe)
Connection	Waterproof cable gland with terminal internal board
Measurement range	-40°C e +180°C
Precision	±2°C in the entire measurement
Digital outputs	
Type	Open drain circuit, voltage-free and protected against voltage surges
Frequency	da 0 a 5 Hz
Pulse duration	100ms
Maximum voltage	30Vdc
Maximum current	50mA
Irradiation output features	240 W/m^2/Hz (0 W/m^2 a 0 Hz)
Temperature output feature	44°C/Hz (-40°C a 0 Hz)
Current outputs	
Type	Active current source 4-20 mA with common negative and limiter
Irradiation output features	75W/m^2/mA (0W/m^2 a 4 mA)
Temperature output feature	13,75°C/mA (-40°C a 4 mA)
Serial port	
Interface	RS-485 Half-duplex, 2 wires plus shielding
Devices that can be connected	128
Speed	2400 o 115200 bps selectable
Parity	Even, odd, none, none +2 stop bits
Protocol	Modbus RTU (OPTIONAL not available in basic model)
Insulation	2500 Volts

The composite sensor can detect solar irradiation values and temperature and send it to a datalogger through configurable outputs like pulsed digital or analogue ones, 4-20mA. The sensor allows precise detection of two fundamental parameters for the evaluation of the performance of photovoltaic plants: irradiation and operating temperature of the panels.

By considering these measurements it is possible to define the real performance of the plant and detect any problems that can cause the real efficiency to vary from theoretical values.

The irradiation is detected by means of a sensor protected by an optical glass window inserted in a waterproof structure with an IP65 protection rating. Within the module the sensor temperature is also detected, which is useful for accurate compensation.

Detection of the temperature is performed by means of a PT100 probe interface externally mounted to module. For the connection, all types are considered: 2, 3 or 4 wires. (PT100 probe with 4 wires; L = 2 mt OPTIONAL).

The pulsed digital outputs allow it to interface directly with the X-Meter or X-RWU data logger. The outputs can be selected as analogue 4-20mA to connect the device to any process controller or data logger.

A standard insulated RS-485 serial ports is also available, which can be used to read the measured values using the Modbus RTU protocol (Not enabled for the basic model).

Wireless Solarimeter via radio
Sensor for Solar Radiation and Temperature PT100 with GSL-IT-W Radio module

This sensor can detect Solar Irradiation and Temperature and transmit the values to a radio-receiving module which sends them to a processing unit. It's supplied by an internal battery. Using this device, it is possible to detect with precision the irradiation and working temperature of the panels, fundamental parameters for determining the performance of photovoltaic systems. By considering these measurements it is possible to define the real performance of the plant and detect any problems that can cause the real efficiency to vary from theoretical values.
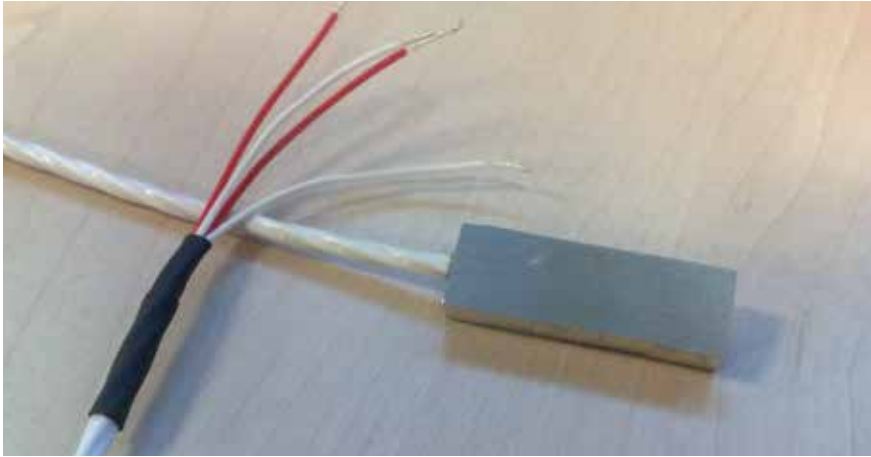
The irradiation is detected by means of a sensor protected by an optical glass window inserted in a waterproof structure with an IP65 protection rating. Within the module the sensor temperature is also detected, which is useful for accurate compensation. The measurement of the external panel temperature is carried out by a PT100 probe, provided as optional accessory and mounted externally on the module.

The radio-receiving module implements the warning signal when the remote sensor battery is low. This occurs a few weeks before its complete discharge.

Technical data

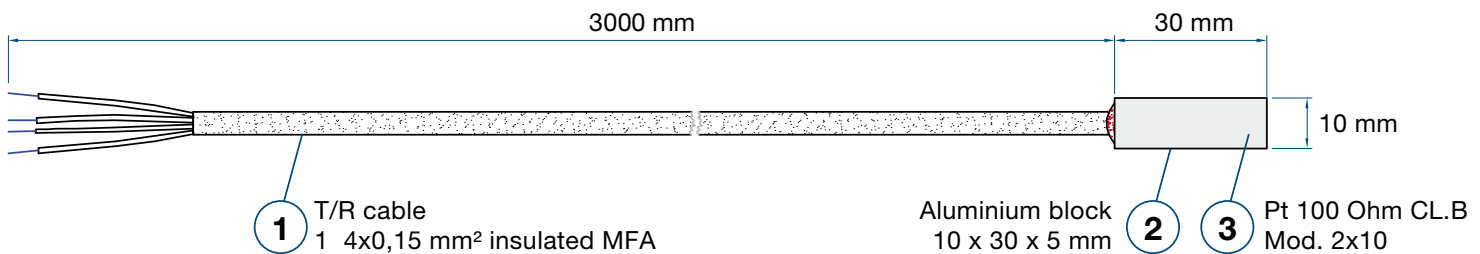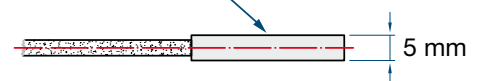| General	
Dimensions	120x80x45 mm
Weight	320 grams, including battery
Case material	Polycarbonate for the case, polyamide for the accessories
Protection rating	IP65
Power supply	Internal lithium battery; Life: 5 years with one transmission per minute
Operating temperature	-20°C ÷ +70°C
Relative humidity	90%
Other features	It includes an anticondensation device
Irradiation	
Sensor	Fotodiodo
Measurement range	0 ÷ 1200 W/m^2
Precision	2.5% in sunny conditions with irradiation of 100 W/m^2
Operating	
Sensors used	2, 3 or 4 wire interface for PT100 (4 wire PT 100 probe optional)
Connection	Waterproof cable gland with internal terminal board
Measurement range	- 40°C ÷ +180°C
Precision	±2°C in the entire measurement
Radio	
Range	300 meters in open field
Frequency	868 MHz

Panel temperature probe

4 wire PT100 prove with sensor protected by an anodized aluminium block 10x30x5 mm. Insulated MFA cable (3m 4x0.15 mm2) and double-sided mounting adhesive for the sensor.

Class "B" thermocoupling according to CEI 60751. Maximum temperature 200°C

ADHESIVE SURFACES
3M - Type VHB 9469 PC

5 mm

3000 mm   30 mm

10 mm

1 T/R cable
1 4x0,15 mm² insulated MFA

Aluminium block
10 x 30 x 5 mm **2**

3 Pt 100 Ohm CL.B
Mod. 2x10

Outdoor temperature probe

62 mm   38 mm

1

80 mm

~60 mm

3 Finned well
in anodized
aluminium

2

PT100 Ohm Sensor
at 0°C Accuracy:
Class "A" in accordance
with CEI EN60751

⌀20 mm

4 wire PT100 probe with sensor protected by external finned element in anodized aluminium Cable housed in IP65 box Palazzoli Mod. 101025 in plastic.

Class "A" thermocoupling according to CEI 60751. Maximum temperature: 80 °C.
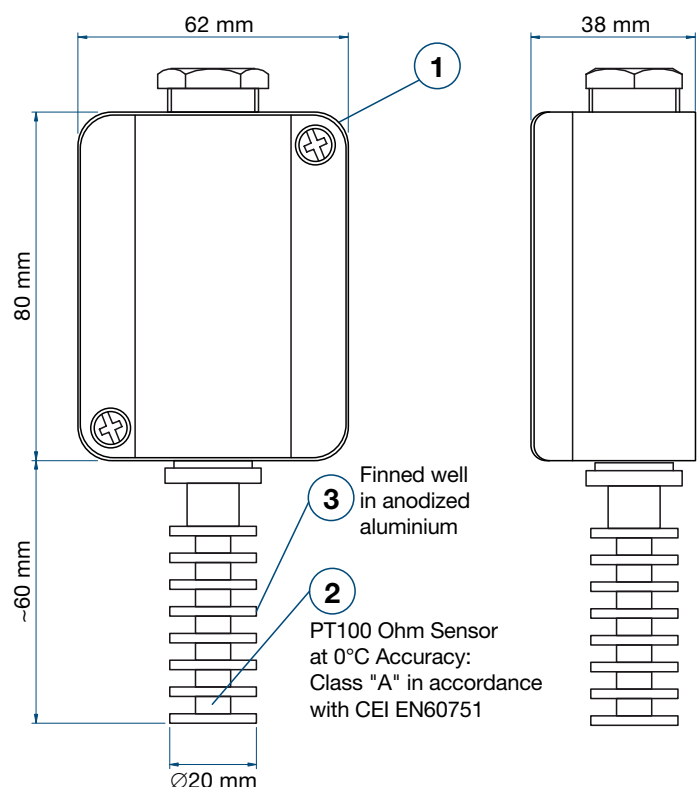
LSPU
Load Shedding Peripheral Unit

> *We are the **absolute leaders in this sector**, on the market with over 70% of the active systems*

Description

The Load Shedding Peripheral Unit (LSPU) is the interface that allows MV/HV industrial users to be "interruptible" and was built in compliance with TERNA (National Transportation Network Manager) technical specifications. It has a modular architecture and is made up of components that are specifically for industrial use. Through a router (supplied by the telephone service provider) the LSPU communicates with the Terna Interruptible Manoeuvre Bank (BMI), from which it receives commands and sends signals reporting the status of operations and measurements from the field. The LSPU communicates through the IEC60870-5-104 protocol and supports Multicast UPD/IP mode as set forth in GRTN DRRPX02039 dated 10/9/2003 and subsequent modifications. Each individual LSPU is able to manage up to four loads with "instantaneous" or "emergency" release mode.

For each load, the signals exchanged between the LSPU and the field are:
> 1 analogue input, 0-20 mA or 4-20 mA with resolution of 15 bits + sign for the instantaneous measurement of load power coming from a special converter (optional).
> 6 optically isolated digital inputs for the acquisition of switch position signals, test signals and for monitoring the status of the output relays.
> 4 digital outputs for open/block, unlock switch test and anomaly.

The open command uses a bi-stable relay (magnetic) able to maintain its status even without power. It has three 10A exchange contacts with a switching time of 5 ms. The LSPU must be powered with 230 Vac-50Hz from a line protected by a differential switch (Id=30 mA). To protect against disturbances from the power line, there is a shielded insulating transformer, while for micro and brief interruptions (up to 30 mins), a UPS is supplied. An optional UPS is available with alarm outputs for monitoring. For time synchronization, the LSPU is equipped with a GPS receiver based on which all of the signals sent to TERNA are time-stamped with the exact instant they were verified.

The reference technical standards for the equipment that make up the LSPU are:

IEC1132-1
IEC 801-2.4.5
IEC 68

The LSPU is in a RAL 7032 coated sheet metal cabinet with IP43 protection rating according to EN60529 (NEMA4) with the following dimensions:

Height: 1500 mm
Width: 600 mm
Depth: 400 mm

In addition to the LSPU, a control and supervision system called DATASCOPE is available. It can be used to continuously monitor the operation of the LSPU. DATASCOPE is a passive attachment that listens, analyzes and archives all of the communication between the LSPU and TERNA and publishes the data through a server. By accessing the reserved area on the server, the customer can consult all of the historic data and perform calculations aimed at determining the expected remuneration.

Remote readings

Energy Team includes among its activities a remote meter reading service thanks to which each customer can consult remotely read consumption data online. Currently Energy Team remotely readsenergy consumption (electricity, water, gas, steam) from thousands of users. The remote reading can be performed in three modes (via GSM, GPRS or Ethernet) depending on needs and the type of data logger installed.

The following activities are performed daily:
> verification of successful remote reading
> data integrity check
> transfer of data to the website.
The following is also performed periodically:
> management and maintenance of the database
> project management
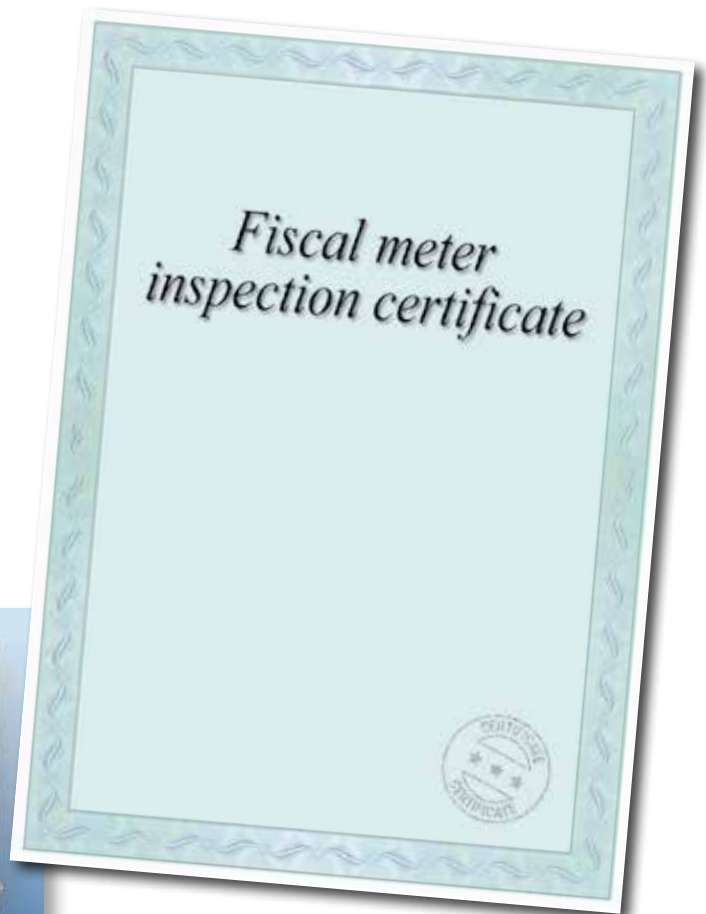> various activities and materials.

The Assistance and Maintenance contract includes the repair of all covered devices, the replacement of the devices in the event of failure as well as telephone assistance. All activities performed by Energy Team include remote reading, storage, management, transmission and publication of the data acquired from the delivery points where the customer has activated the services.
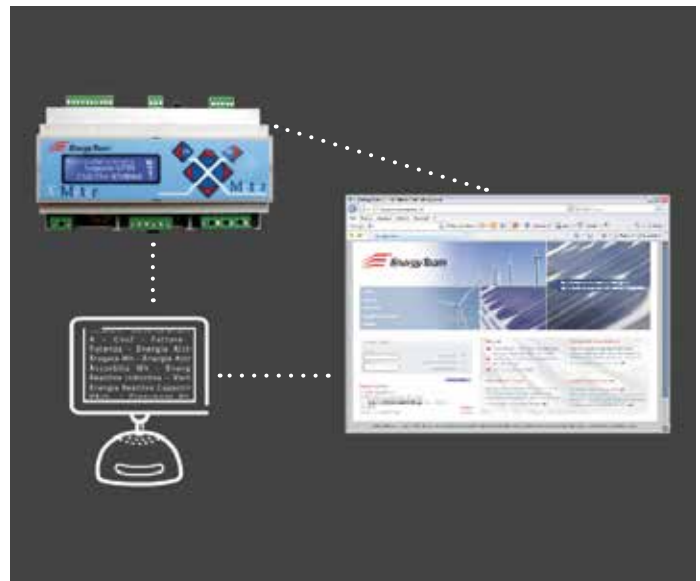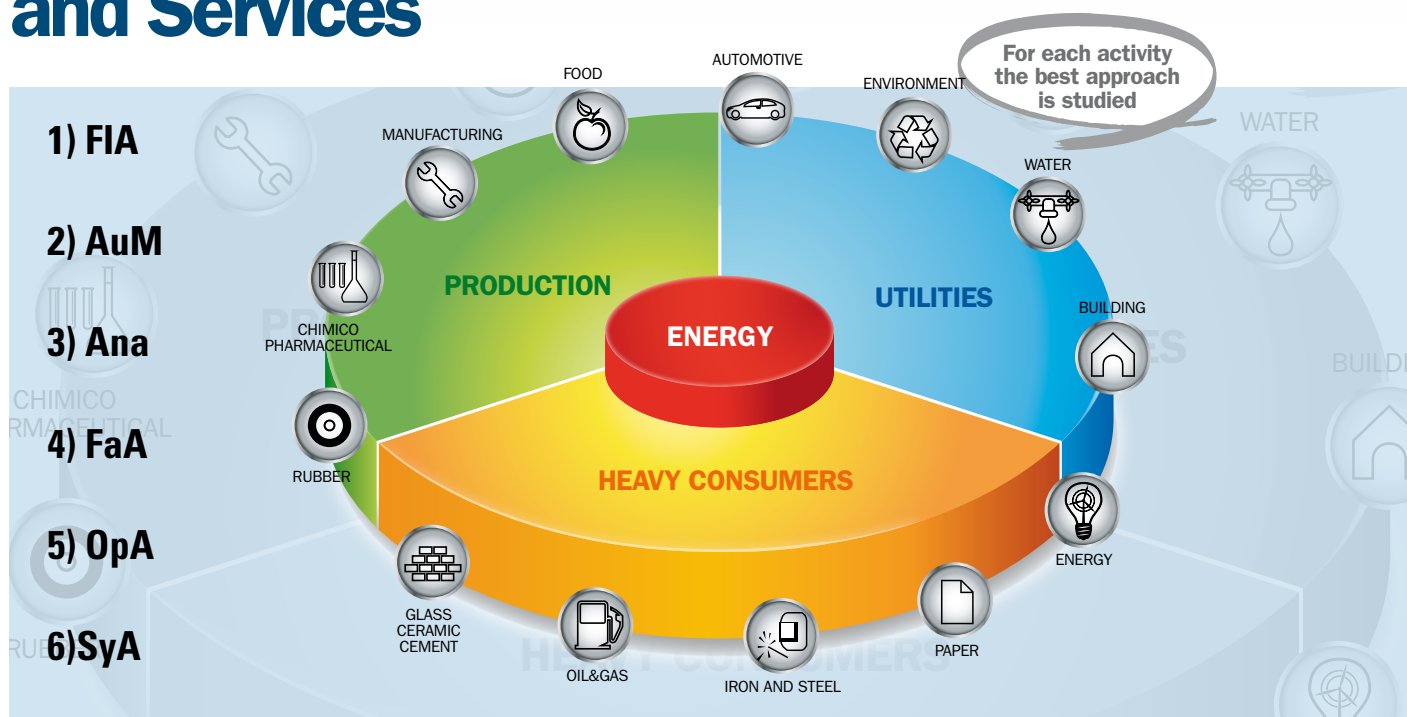
Certification
fiscalmetering units

Energy Team offers supply, verification, calibration and sealing of fiscal meters and TA for the measurement of three-phase energy. All meters are MID certified and according to the standards defined by the GSE. A software module is also available that is downstream from the consumption data acquisition and automatically compiles the sheet to be presented to the UTF.

Fiscal meter inspection certificate

Energy Audit Service in Industry and Services

1) FIA

2) AuM

3) Ana

4) FaA

5) OpA

6) SyA

For each activity the best approach is studied

PRODUCTION • UTILITIES • HEAVY CONSUMERS • ENERGY

FOOD • AUTOMOTIVE • ENVIRONMENT • WATER • MANUFACTURING • BUILDING • CHIMICO PHARMACEUTICAL • RUBBER • GLASS CERAMIC CEMENT • OIL&GAS • IRON AND STEEL • PAPER • ENERGY

1) FIA - FLASH AUDIT: THE FIRST STEP TOWARDS EFFICIENCY

> Need for companies to approach the theme of Energy Management
> Need for an incremental approach that can be studied in relation to the company's needs

DESCRIPTION	ADDED VALUE
1 day intervention in the company to evaluate macro-consumption, the condition of the Management System Energy (or its absence) and indicate the first potential interventions	Awareness of the methodology needed to implement an Energy Management System and starting points (operational and management) to improve performance, the first step in an incremental path
Pie graph of consumption per energy factor and energy use	Initial sharing of the approach and methodology for analyzing the Energy Management System
Sharing of methodology to identify an Energy Baseline and implement an Energy Review	

2) AuM - MONITORING AUDIT: A DIAGNOSTIC APPROACH

> ISO 50001 methodology: measurements and monitoring as the cornerstone of any Energy Management System
> According to the type of commitment that the company is able to make, a measurement monitoring and detection system is designed

DESCRIPTION	ADDED VALUE
1 day intervention at the company, possibly with specialized technical support to plan the structure and points of the monitoring system and any sub-metering	Possibility of planning the consumption data detection structure and focus attention on some specific aspects with ad-hoc sub-metering campaigns
Consulting on fiscal benefit opportunities/ interruptibility	Possibility of paying the instrumentation with fiscal savings - interruptibility return
	For multi-site customers, the possibility of designing a remote data monitoring and sharing

3) AnA - EnPI ANALYSIS: PERFORMANCE EFFICIENCY

> Each energy use requires the identification of an EnPI index (Energy Performance Index) that correlates the energy consumption with the production output
> It is the main parameter for the basis fo the analysis and comparison over time of the effectiveness of the Energy Management System

DESCRIPTION	ADDED VALUE
Definition of the EnPI for each energy use considered with related alarms on the variations (absolute and Cu-sum)	Identification of the performance indices that best represent the energy consumption/product unit relationship, possibility of comparing performance over time
	For cost centre management provides a normalized index of performance
	Immediate awareness (alarms) of any variations from the scale

4) FaA - FEASABILITY AUDIT: OF THE DIAGNOSIS FOR THERAPY

> Based on the analyses performed, various types of interventions are proposed that act along 2 lines: Management and Technological
> The list of solutions proposed is sorted by cost and invasiveness of the production process along with an estimate of ROI time and the ability to use the FTT and obtain White Papers

DESCRIPTION	ADDED VALUE
Feasibility study for the evaluation of management and/or technological solutions for improving consumptions and seeking better technology	Specifically for analysis of 1 or more energy uses (e.g., AC/lighting/furnace…) with precise technical/ economic feasibility analysis and White Papers
Identification of subjects to finance the chosen solutions	Possibility of financing the operation through ECSO intervention
Our specialized technical consultants collaborate closely with the maintenance and system supervisors	Identification of best management and operational practices (maintenance, settings, etc.)

5) OpA - OPERATIONAL AUDIT: EFFICIENT OPERATIONAL MANAGEMENT

> The audit activity is extended to all corporate energy uses and calls fora continuing presence in the company of about 10 days
> All of the solutions and improvement opportunities are implemented butmanagement/documentary support for system certification is not provided

DESCRIPTION	ADDED VALUE
All of the solutions and improvement opportunities are implemented but management/documentary support for system certification is not provided	Aimed at the energy analysis of the entire site, with indications for improvement opportunities and savings
Requires 10 days of on-site activity for monitoring, training and reporting	For those who don't need posted certification but do need a consistent management system

6)) SyA - SYSTEM AUDIT: FOR ISO 50001 CERTIFICATION

> The audit activity is extended to all corporate energy uses and calls fora continuing presence in the company of about 10 days
> All of the solutions and improvement opportunities are implementedand documentary management support is provided aimed at certification

DESCRIPTION	ADDED VALUE
Audit extended to all corporate energy uses to analyze consumption and variables and to define the opportunities for improvement	Aimed at the energy analysis of the entire site, with indications for improvement opportunities and savings
The onsite monitoring, training and reporting activities will be proportional to the complexity of the system	Is the most complete and up-to-date system for reaching certification
Path to certification with operation and documentary support	For those who need posted certification and a guided path

Notes

Notes

QR Code

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